RBS
The Royal Bank of Scotland

Quarterly Commodity Companion

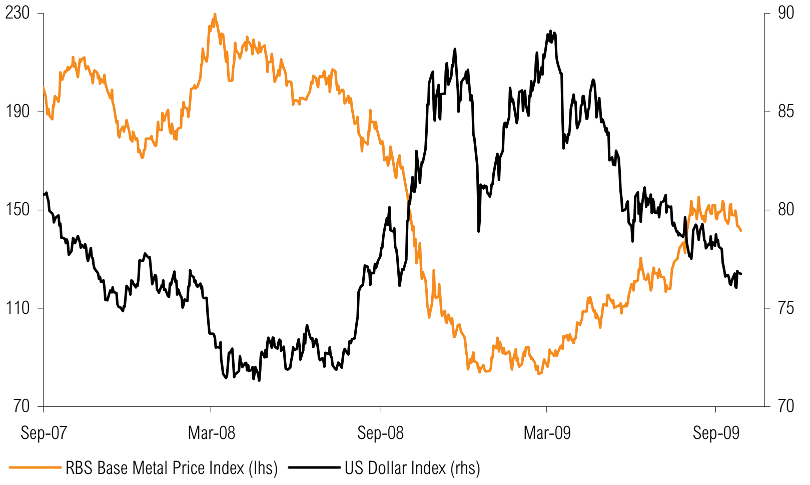
1 October 2009

Boom, Bust, Re-adjust

This material should be regarded as a marketing communication and may have been produced in conjunction with the RBS trading desks that trade as principal in the instruments mentioned herein.

> ***"There is a tide in the affairs of men, which, taken at the flood, leads on to fortune; omitted, all the voyage of their life is bound in shallows and in miseries. On such a full sea are we now afloat, and we must take the current when it serves, or lose our ventures." Shakespeare's Julius Caesar***

Trade-weighted US dollar index vs the RBS Base Metal Price Index. The weaker US dollar has breathed fresh life into metals.



Source: Bloomberg, LME and RBS

Commodities from zero to hero in just nine months

Commodities have gone from investment pariah to the 'darling of the diggin's' in just nine months. Economies exiting recession, a sharply weaker US dollar and the return of the consumer augur well for commodity prices. The RBS Base Metal Price Index since its December 2008 nadir has risen 70%. Precious metals have set hearts aflutter with gold recapturing the US$1,000/oz marker. Other heavyweights such as oil, iron ore, coal and natural gas are also on the move.

It is now essential for real demand growth to take up the baton

We are now seeing the dismantling of the temporary bridges across the recession, which included monetary and fiscal stimulus, hefty supply cutbacks, Chinese commodity stockpiling and various 'cash-for-clunkers' schemes. It is crucial for the delicate tendrils of real demand growth to become robust.

Watch out for the price relapse before sunny uplands come into focus

The world recession is over and we forecast world GDP growth will rebound by 3.6% in 2010. Commodity prices are now likely to pause for breath after their strong rallies. Price-induced reactivation and the end to Chinese stockpiling will likely temper pricing tension, but post 1H 11, markets look more robust. Stay with precious metals, where platinum and palladium will likely outperform silver and gold. Base metals are led by copper, lead-zinc then aluminium, with nickel least favoured. Bulk commodities iron ore, thermal and coking coal and uranium are stirring from their slumbers and should not be overlooked. Oil has risen, but has struggled to maintain traction; 2010 should see a firmer tone as demand returns. Natural gas looks to have bottomed and faces much improved prices ahead.

Nick Moore
Head of Commodity Strategy
nick.metals.moore@rbs.com

Stephen Briggs
Commodity Strategy
stephen.metals.briggs@rbs.com

Daniel Major
Commodity Analyst
daniel.major@rbs.com

Jacques Cailloux
Chief European Economist
jacques.cailloux@rbs.com

Brison Bickerton
Oil and Gas Analyst
brison.bickerton@rbssempra.com

Warren Edney
Mining Equity Analyst
warren.edney@rbs.com

www.rbsm.com/strategy
www.rbssempra.com

Companion contents

Commodities in a nutshell 3

Commodity positioning 6

Overview – Boom, bust, re-adjust 7

Commodity price forecasts - 2009-13F 20

Economic focus – No straight line to sustained expansion 23

Economics – China special – The euphoria will fade 32

Commodity reviews

Industrial/base metals

Aluminium – Economically geared metal faces huge challenges 34
Copper – Remains our most favoured base metal 42
Nickel – Back from the abyss - but too fast too early? 51
Zinc – Middle order batsman biding its time 59
Lead – Destined for even greater glory 65
Tin – This laggard should start catching up in 2010 70

Precious metals

Gold – Agnostics become believers – well done gold! 72
Silver – Partying to the hilt 81
Platinum and palladium – PGMs comfortably eclipse gold 84

Bulk commodities

Iron ore – Structural change in iron ore 91
Coal – No return to previous price lows 100

Energy

Crude oil – Looking for Q4 09 economic recovery 111
US natural gas – Prompt prices have likely bottomed 117
Uranium – Uranium demand is on the rise 120

Quant analytics

Commodity & FX relationships – Currencies predict commodity prices 128

Commodity Companion appendix

Guide to everyday uses for commodities 131
A simple guide to commodity indices 134
Commodity indices – negative roll reduces returns 138
Precious metal ETFs – stabilisation 140
World's top commodity producers and consumers 142
Global refined base & precious metal production and consumption 154
World's top 50 central bank gold holdings 159
30-year real and nominal base and precious metal prices 160
Glossary of useful mining and industry websites 163

We thank our colleagues across asset classes for their invaluable contributions to this Commodity Companion.

Commodities in a nutshell

Aluminium (transport, packaging, construction)

- Aluminium's price recovery from the lows has been the most muted among the base metals. It may well have the greatest upside potential from current price levels in the longer term but we take a broadly neutral stance for 2010.
- Aluminium is economically geared and we expect demand growth of 10% pa in 2010-11. But nearly half the producer cutbacks of ~7mtpa have already been unwound and we forecast that the market will remain in surplus in 2010.
- However, industry stocks are very low and we expect the market to be tightening rapidly by 2012. We forecast that the aluminium price will top US$3,000/t in 2013.

RBS aluminium price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**84**	117	75	90	100	115	130	110
US$/t	**1,850**	2,571	1,645	2,000	2,200	2,525	2,875	2,425

Source: LME, RBS forecasts

Nickel (stainless steels and alloys)

- Nickel is our least preferred industrial metal. It is burdened with a big overhang of excess inventory and idled capacity, plus a parade of new mines. All this will take time to be absorbed and we expect the nickel price to drift in 2010.
- However, nickel is economically highly geared and after a sharp decline since 2006, we forecast that demand will rise by 10% pa in 2010-13. This should tip the market into deficit in 2012-13 and finally lead to some pricing tension.

RBS nickel price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/lb	**7.87**	9.53	6.67	7.05	7.95	8.75	10.45	6.80
US$/t	**17,340**	21,020	14,700	15,500	17,500	19,250	23,000	15,000

Source: LME, RBS forecasts

Lead (lead-acid batteries)

- Lead has been the best performer of 2009 to date, partly due to the relative resilience of demand. Production from scrap cannot on its own meet future demand growth and the primary sector is hampered by lead's by-product status.
- We expect the lead market to return to deficit in 2011-13, leaving it just as tight as in 2006-07. After consolidating in 2010, the lead price is forecast to reach US$2,750/t in 2013.

RBS lead price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**103**	95	77	102	109	115	125	77
US$/t	**2,275**	2,084	1,700	2,250	2,400	2,525	2,750	1,700

Source: LME, RBS forecasts

Copper (electrical cable, wiring and tubing)

- Copper remains our most preferred base metal. It may not have the greatest upside from current levels but we expect the copper price to reach a new all-time high by 2013.
- Copper's demand prospects are not among the best but we believe copper producers will have the most difficulty in keeping up with growing demand. We forecast an underlying market deficit by 2011 and that by 2013 it will be fast approaching pre-recession tightness.
- Before then, copper still has some work to do. A large surplus has been disguised by Chinese stockpiling and some material may resurface, so easing the path to deficit.

RBS copper price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**278**	315	230	305	330	375	410	225
US$/t	**6,135**	6,951	5,075	6,750	7,250	8,250	9,000	4,950

Source: LME, RBS forecasts

Zinc (galvanized steel for corrosion protection)

- Zinc has been in the middle of the base metal pack in 2009 and we expect it to remain there in 2010-11 before it comes into its own in 2012-13. We forecast that zinc will grind higher next year but that it will top US$2,500/t by 2013.
- The zinc market has been in hefty surplus in 2009 and we expect it to stay in (smaller) surplus in 2010-11 as producer restarts offset strong demand growth. But the lean pipeline of new mine capacity points to large deficit from 2012.

RBS zinc price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US¢/lb	**87**	85	72	92	98	109	116	82
US$/t	**1,910**	1,870	1,585	2,025	2,150	2,400	2,550	1,800

Source: LME, RBS forecasts

Tin (solders, food/beverage tinplate cans)

- Tin has had its own drama but has lagged behind in this year's price recovery. We expect it to start catching up in 2010 and forecast that tin will eventually hit US$18,000/t.
- Tin demand has fallen heavily since 2006 and a sizeable surplus has developed this year. But we forecast that supply will barely keep up with recovering demand next year and expect growing market tightness from 2011.

RBS tin price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/lb	**6.85**	8.39	6.25	7.25	7.80	8.05	8.15	6.80
US$/t	**15,100**	18,487	13,775	16,000	17,250	17,750	18,000	15,000

Source: LME, RBS forecasts

Gold (jewellery, investment, coins)

- Gold set to average ~US$950/oz in 2009, will uniquely among the metals, have had 8 consecutive years of higher yoy average annual prices. An enviable track record.
- Gold above the US$1,000/oz marker is the canary in the mine. Gold is a classic harbinger of future inflation (watch out bonds). It has also drawn strength from the weaker US dollar and acute investor interest despite weak jewellery sales. These should reverse as we enter the Gifting Season
- Physically backed gold ETFs are now worth a record US$55bn. A new Central Bank Gold Agreement has come into force, but even central bankers like gold, with the CBGA2 ending with the lowest annual sales in 10 years!

RBS gold price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**1,000**	872	950	1,000	975	1,000	1,150	825

Source: LBMA, RBS forecasts

Platinum (vehicle auto catalysts, jewellery, coins)

- Even after its impressive price recovery this year, we expect platinum to trend much higher through 2010-13, outshining gold and eventually returning towards US$2,000/oz.
- Industrial and jewellery demand should recover strongly in 2010-11. We forecast that platinum producers will struggle to keep pace, and buoyant physical investment demand may lead to real market tightness in the years ahead.

RBS platinum price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**1,285**	1,572	1,200	1,450	1,550	1,600	1,800	1,400

Source: LBMA, RBS forecasts

Coal (power generation, steel production)

- Annual contract metallurgical coal prices for 2009/10 slumped by about 60%, but the market has already tightened since on strong Chinese steel production. Indian demand should be supportive too and we forecast a 17% recovery in hard coking coal price contracts for 2010/11.
- Thermal coal remains a buyer's market. However, we expect Indonesian exports to decline and Indian imports to rise in the coming years, necessitating more investment in Australian capacity. With costs proving sticky, we forecast modestly higher thermal coal prices in 2010 and beyond.

RBS coal price forecasts

US$/tonne	2008	2009	2010F	2011F	2012F	2013F	LT
Hard Coking	305	128	150	150	145	145	100
% yoy	211%	-58%	17%	0%	-3%	0%	
Thermal	125	69	75	78	80	83	65
% yoy	125%	-45%	9%	3%	3%	3%	

Source: TEX, Platt's, RBS forecast

Silver (photography, jewellery, investment)

- In traditional fundamental terms, silver remains, in our view, the weakest of the precious metals. Yet its price recovery has been amongst the strongest. Silver is a geared play on gold and investor appetite has been voracious.
- Photography is likely to continue to decline and jewellery demand is sensitive to price. Against this, scrap supply is forecast to decline and mine output to stagnate, but we expect underlying supply surplus to persist.
- However, physical investment, chiefly through the ETFs, has shown itself amply able to hoover up the surpluses. We see no reason why this should not continue, given the outlook for gold. Silver is forecast to trend up towards US$20/oz.

RBS silver price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**16.40**	14.99	14.50	17.50	16.00	16.75	19.00	13.00

Source: LBMA, RBS forecasts

Palladium (auto catalysts, jewellery, electronics)

- We believe palladium has the most upside potential of all exchange-traded metals and forecast that the price will more than double in the next four years to US$700/oz plus.
- Even with soaring scrap supply, rebounding industrial demand will keep the palladium market in large underlying deficit. Robust physical investment may further tighten the market and crucial Russian state sales will eventually end.

RBS palladium price forecasts

	Current	2008	2009F	2010F	2011F	2012F	2013F	LT
US$/oz	**290**	351	250	350	400	475	650	400

Source: LBMA, RBS forecasts

Iron ore (raw material for steel production)

- We have raised our forecast of the long-term iron ore price. For fines we have raised it by fully 33%. With China, not Japan, now the price setter, marginal costs in China must be taken into account as well as the incentive price for Australian and Brazilian production.
- In the shorter term we still forecast a modest recovery in annual contract iron ore prices for 2010/11 despite the recent decline in spot prices. We expect a marginal under-utilisation of iron ore production capacity in the next few years but cutbacks in China should limit any surplus.

RBS iron ore price forecasts

US¢/dltu	2008	2009F	2010F	2011F	2012F	2013F	LT
Fines	147	99	108	117	105	94	86
% yoy	80%	-33%	10%	7%	-10%	-10%	
Lump	205	114	125	135	124	112	102
% yoy	97%	-44%	10%	8%	-8%	-10%	

Source: TEX, Platt's, RBS forecast

Crude oil (transport, petrochemicals)

- The sharp contraction in global petroleum demand seen in late 2008 and into 2009 led to the rapid build up of crude oil and distillates inventories around the world.
- Despite little recovery in real demand for petroleum products and near record levels of crude and distillate inventories, crude prices have rallied from their lows. YTD crude oil has traded more in line with equity and currency markets than the intrinsic supply/demand balance of crude.
- Short term, oil markets need to see global distillate inventories begin to draw down for WTI to trade significantly above $80/bbl. Longer term we expect the upturn in the business cycle drive a recovery in real demand that will push prices back towards $100/bbl by 2013.

RBS crude oil price forecasts

US$/bbl	Current	2008	2009F	2010F	2011F	2012F	2013F
WTI	67	99.75	62	78	85	90	100
% yoy		38%	-38%	26%	10%	6%	11%
Brent	66	98.52	63	79	87	92	102
% yoy		36%	-36%	26%	9%	6%	11%

Source: Bloomberg, RBS Sempra forecasts

US natural gas (heating, power generation)

- We do not believe US production will exceed total storage so as to cause an inventory glut in October. The prompt US gas price has likely bottomed, but heavy inventories will keep prices depressed until the onset of cold winter.
- The US year over year inventory surplus will slowly be worked off over the course of this coming winter, supporting prices in 2010. However, a bull market in US natural gas is unlikely to develop in the near term without signs of a larger than expected decline in domestic production.
- Longer term we expect to see the prompt US natgas price back towards $7/MMBtu. The Baker Hughes US rig count remains at heavily depressed levels. As a result, when gas demand picks up the supply response may be delayed. This should underpin stronger prices in the longer term.

RBS US natural gas price forecast – prompt NYMEX/Henry Hub

$/MMBtu	Current	2008	2009F	2010F	2011F	2012F	2013F
H-Hub	4.80	8.90	4.25	6.25	6.50	6.75	7.00
% yoy		25%	-52%	47%	4%	4%	4%

Source: Bloomberg, RBS Sempra forecasts

Uranium (power generation)

- A steady stream of new reactors coming on line in the coming years, predominantly in Russia and China, will support stable uranium demand growth.
- Supply of US-Russian HEU (highly enriched uranium) is due to end in 2013. Forecast increases in mine production will not offset the exit of US-Russian HEU; as a result we expect the uranium market to move into deficit by 2014.
- We believe the days of sub-US$20/lb uranium are history. New mine operating costs are US$20-30/lb; this will provide a firm floor to the uranium price. We forecast that the uranium price will peak in late 2011 at US$95/lb as the market tightens ahead of the expiry of the US-Russian HEU down blending programme in 2013.

RBS spot uranium price forecasts

US$/lb	2008	2009F	2010F	2011F	2012F	2013F
	63.4	47.4	58.8	82.5	82.5	65.0
% yoy		-25%	24%	40%	0%	-21%

Source: UxC , RBS forecasts

Commodity positioning

The table below shows our commodity preferences over two time frames. The first is a year ahead. We have taken the average spot price in September 2009 and compared it with our price forecast averages for the final quarter of 2010. On this analysis we are from current levels most bullish on natural gas (+88%), palladium (+28%), oil (+21%) and platinum (+16%). Our least favoured are nickel (-8%); gold (n/c) and lead (2%).

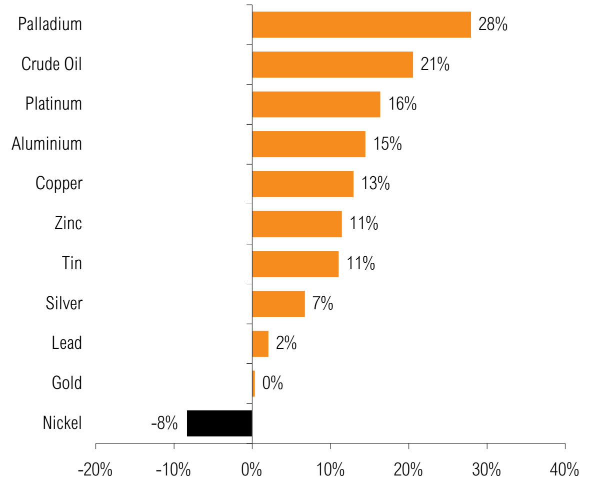
However, the rankings change if we view current prices in relation to our H2 2013 expectations for deep inventory-draining deficits to have emerged, the world economy to be fully back into its stride and commodities in general to be in effervescent mood. Our top picks on a four-year view are palladium (+139%), natural gas (102%), aluminium (64%) and copper (53%).

Ranked forecast price moves for key exchange traded commodities from September average price levels to the RBS forecasts 1 and 4 years ahead

		Sept.'09 Av.	Q4 10F Av.	% Change	H2 13F Av.	% Change
Industrial						
Aluminium	US$/t	1,834	2,100	15%	3,000	64%
Copper	US$/t	6,196	7,000	13%	9,500	53%
Zinc	US$/t	1,884	2,100	11%	2,600	38%
Nickel	US$/t	17,468	16,000	-8%	24,000	37%
Lead	US$/t	2,204	2,250	2%	2,800	27%
Tin	US$/t	14,858	16,500	11%	17,750	19%
Precious						
Palladium	US$/oz	293	375	28%	700	139%
Platinum	US$/oz	1,289	1,500	16%	1,900	47%
Silver	US$/oz	16.39	17.50	7%	20.00	22%
Gold	US$/oz	997	1,000	0%	1,200	20%
Oil & Gas						
H-Hub Natgas	US$/MMBtu	3.46	6.50	88%	7.00	102%
Brent Crude Oil	US$/bbl	68	82	21%	100	47%

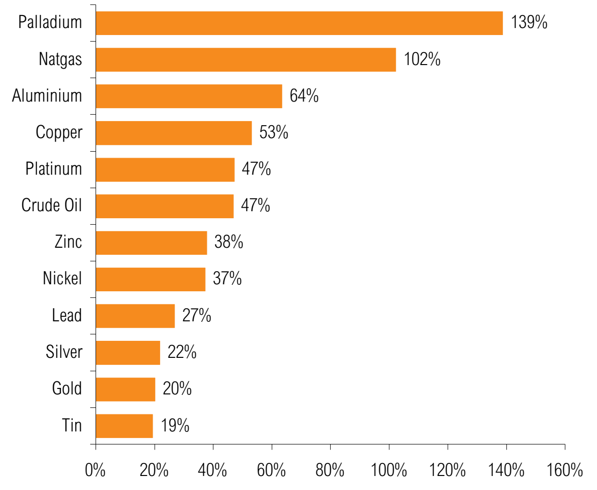
Source: Bloomberg, RBS forecasts

1-year preferences - Forecasts move from Sept. 09 average spot prices to RBS Q4 10F average forecasts



Source: RBS

4-year preferences - Forecast move from Sept. 09 average spot prices to RBS H2 13F average forecasts



Source: RBS

Commodities

Boom, bust, re-adjust

"There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life is bound in shallows and in miseries.
On such a full sea are we now afloat,
And we must take the current when it serves, or lose our ventures."
Shakespeare's Julius Caesar

The tide has turned for commodities

It's no longer a matter of conjecture, but fact that for base and precious metals 2009 has seen a V-shaped recovery

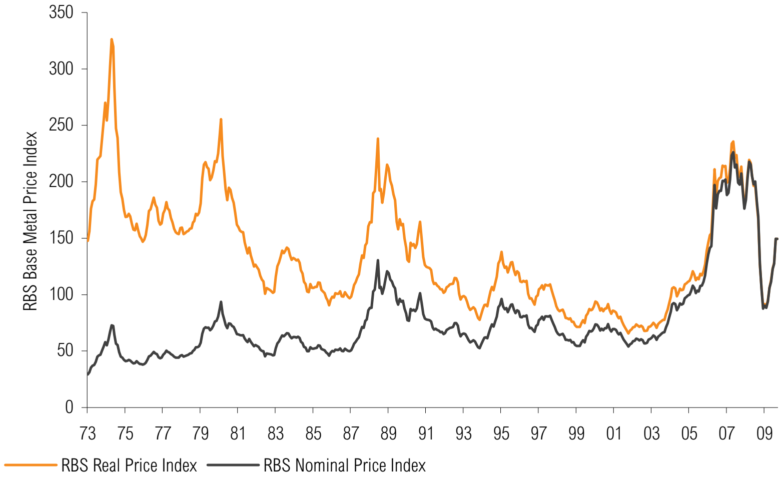
What a difference a few months make! Commodities have gone from investment pariah to the 'darling of the diggin's' in a matter of just nine months. Yes, commodity fund attention and a helpfully weaker US dollar have played their part, but so too have the four key bridges across the recession that we spoke about in our previous *Commodity Companion*, "Bridge over troubled water".

A crucial phase has now been reached, with the baton passing from a financially driven risk rally to the expected 2010 upturn in the world business cycle. In effect, commodities have reached a junction at which the initial stimulus features are on the wane and economic growth translates into real consumer demand. As yet, it is very early days. Forward-looking economic and financial indicators have certainly aligned; now to get the follow-through into genuine consumer offtake.

This year for commodities has been like a wedding at which everyone is showered with confetti. All have shared the joy. Industrial, precious metals and oil have all seen sharp rebounds from their price lows, even though their markets have remained in fairly forlorn shape. Top of the pops in terms of price performance have been lead, copper and zinc. We saw a substantial reversal of fortune for lead, the worst performing metal of 2008 and thus far the best of 2009. Precious metals, notably palladium and silver, have also had an excellent year, with gold setting the heather afire by not only breaking back above the US$1,000/oz marker, but enjoying its longest-ever run of 10 consecutive days in which it traded above US$1,000/oz. Despite this strong run, gold – the best performing metal in 2008 – is thus far up 14% and the worst performing of 2009.

The monthly average RBS Base Metal Price Index enters the final quarter at a 12-month high, recapturing nearly half its losses

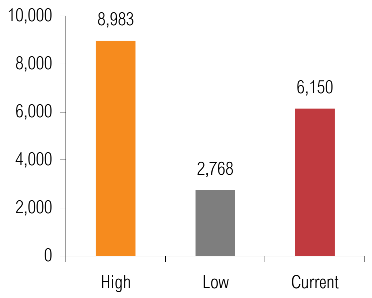
RBS Base Metal Price Index at its highest level in 12 months and up 70% from its December '08 low. V-shaped recovery is fact, not conjecture



Source: LME and RBS

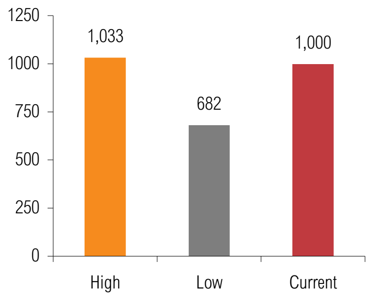
Many commodity prices are already halfway back to their peak levels

Copper has recaptured 54% of the losses since its July 2008 peak



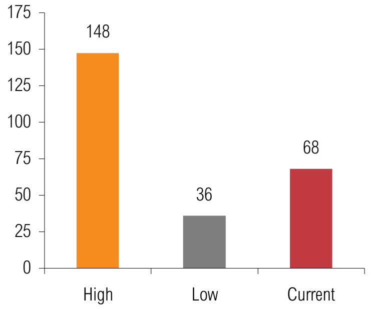
Source: LME and RBS

Gold has recaptured 91% of its losses since its March 2008 peak



Source: LBMA and RBS

Brent oil has recaptured 29% of the losses since its July 2008 peak



Source: ICE and RBS

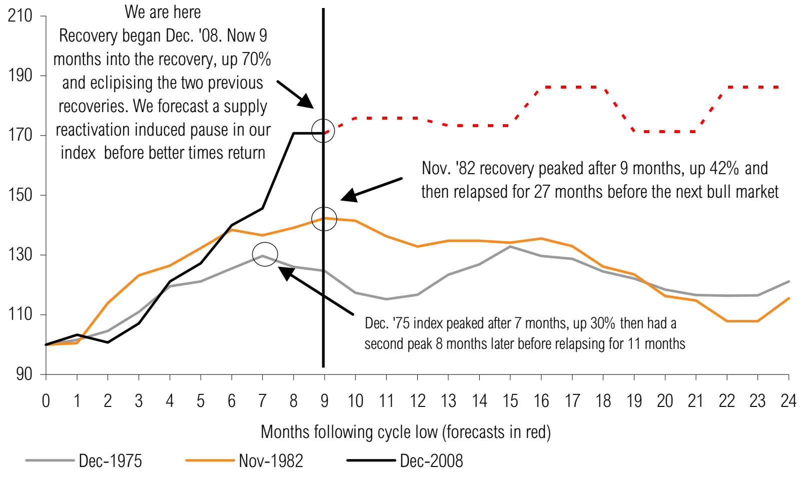
History warns us to expect a relapse in commodity prices

Base metals prices across the board have had an excellent 2009, but let us not forget that commodity markets have not yet reached equilibrium. There are still massive supply surpluses and huge inventory mountains to be eroded. We must not be fooled into thinking that the price gains we have seen are a natural precursor to even better prices ahead. That would be nice, but let us introduce some prudence into our strategic thinking.

This economic recession has been the worst since 1945, but we have had a telescoped commodity cycle – peak to trough in nine months against an average of 41 months for previous price recessions, and trough halfway back to peak levels in just nine months

History can be a useful guide to the future. The chart below shows the monthly progression of the RBS Base Metal Price Index from its lows in the two previous oil–shock-inspired declines of the mid-1970s and the early 1980s. First, all three price cycles bottomed towards the end of the year – the final capitulation and perhaps clearing of the decks before the new year began. Despite the worldwide economic crisis, the recovery in base metal prices as represented by the RBS Index has been eerily similar to the two previous examples. The rally of 1975 **peaked after seven months**, up 30%, then began a meandering relapse. The rally of 1982 **peaked after nine months**, up 42%, then relapsed for 27 months. This cycle bottomed in December, has tracked the previous recoveries and outpaced them in rising 70%, **but at nine months** also seems to be running out of momentum. The common themes here are the fear of price-induced production reactivation and the handing over of the baton, from hope that springs eternal to the reality of the cycle. Batons are easily dropped!

Overlapped chart of the RBS Base Metal Price Index progression in months from the cycle lows of 1975, 1982 and 2008. Strong fit – relapse ahead?



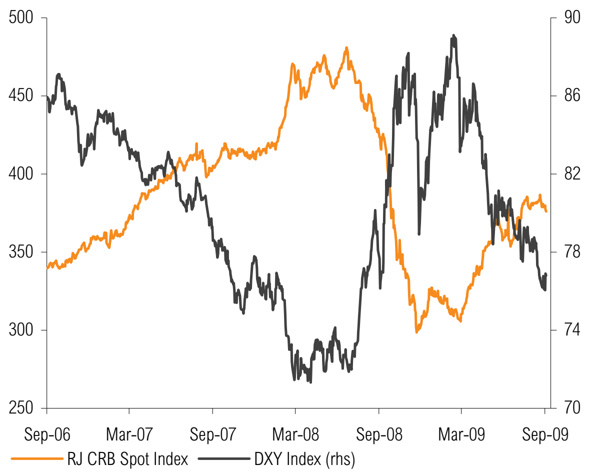
Source: LME and RBS

Risk appetite and US dollar risk to commodity attitude

Not only do we have the price gains running out of upside momentum, but we also must consider two other potential headwinds. The first is the path of the US dollar. Commodities are priced in US dollars, so as a rule, the weaker the US dollar, the better it is for purchasers of commodities in stronger currencies such as euro or yen. The trade-weighted US dollar begins Q4 09 at 12-month lows. The left-hand chart shows the broad-based Reuters/Jefferies CRB commodity index against the trade-weighted US dollar and shows an antithetic relationship. If you think the US dollar will strengthen, commodities are a sell.

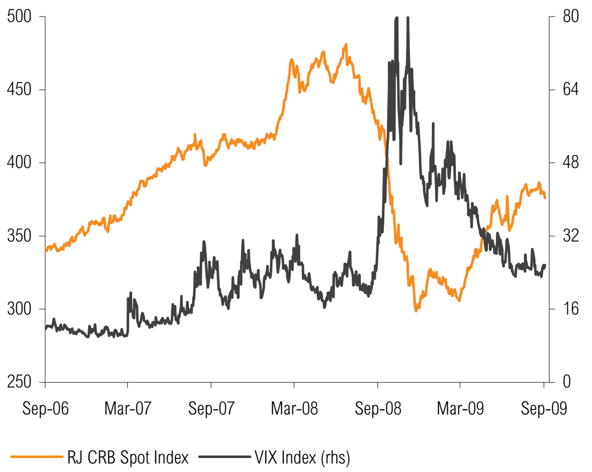
The right-hand chart shows a measure of investor appetite for risk, the S&P 500 volatility or VIX index. As the chart shows, until mid-2008, the RJ/CRB index was able to cruise higher, with the VIX index range trading and showing no signs of what was about to befall markets. As the financial crisis erupted, the VIX ballooned to record levels and the market-sold risk and commodities were prime candidates for selling. This year has seen the VIX index subside towards levels associated with pre-Lehman days, and commodities have rebounded as investors have been happy to take on board the risk trade.

Reuters/Jefferies CRB commodity index vs the trade-weighted US dollar Index



Source: Bloomberg, RBS

Reuters/Jefferies CRB index vs the S&P 500 VIX volatility Index



Source: Bloomberg, RBS

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Job done for the temporary bridges across the recession – now the unwind and dismantling

In our April *Commodity Companion*, we identified four bridges across this recession that would provide temporary solace to the commodity sector while it waited for the genuine recovery in world demand. Each of these has been successful and all are now being unwound. As a reminder, we identified:

Bridge 1: Global monetary and fiscal stimulus, zero interest rate policies and quantitative easing. Rates are now on hold and some central banks have begun raising rates. Unwind of QE and rescue packages under way.

Bridge 2: Massive supply cutbacks. Reactivation is now beginning, notably in aluminium, but all the other metals have shown fraying at the edges. There is a strong yin/yang between price-induced reactivation and demand-induced reactivation. Our preference is for the latter.

Bridge 3: Chinese stockpiling. Has been substantial in 2009, but the past two months have shown significant reduction in commodity imports into China across the commodity spectrum. Copper imports in August were down 25% mom and 43% lower than their record high of 0.373mt in June 2009. Our view is that Chinese stockpiling was in part to sterilise some of its US$2.12trn of US dollar reserves, but also, access to raw materials must not be an impediment to Chinese growth. This is why China is also seeking ownership of commodities. If company equity ownership is blocked, then China will seek access to operating projects.

Bridge 4: 'Cash-for-clunkers'. Schemes were put in place by various governments and auto registrations have soared. Germany and the US have now closed their schemes; others, such as the UK (which has just been extended), are close to reaching funding limits. The market does fret that the schemes have merely brought forward purchases and that auto sales will swoon in 2010.

Watch out for a number of economic and financial headwinds that have yet to come into play

Keep an eye on important headwinds yet to come

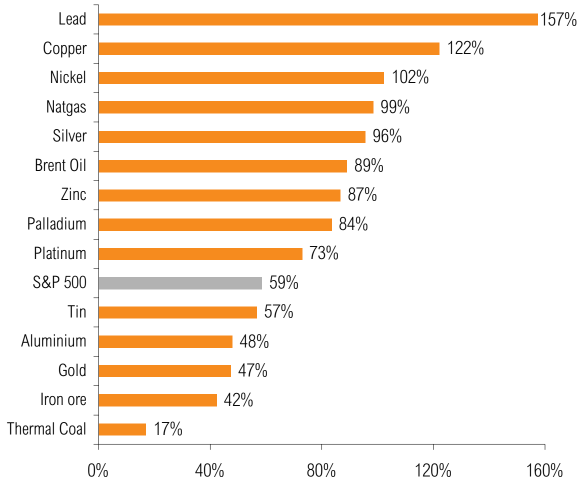
Other factors may come into play during 2010, to provide stronger headwinds to the commodity complex. These include: 1) higher taxes around the world to help pay for the financial crisis; 2) the spectre of a long-term unemployed burden with still rising unemployment numbers; 3) reduced leverage by financial institutions; 4) massive cuts in government capital spending programmes; 5) rising world interest rates; and 6) the removal in the US of real estate housing tax credits.

There may then arise later in H1 2010 a sense that 'is this really as good as it gets?'. Déjà vu plays its part and trend growth slumps lower, as for example in OECD Industrial Production post the 1974 and 1981 oil shocks.

Commodity price winners and losers

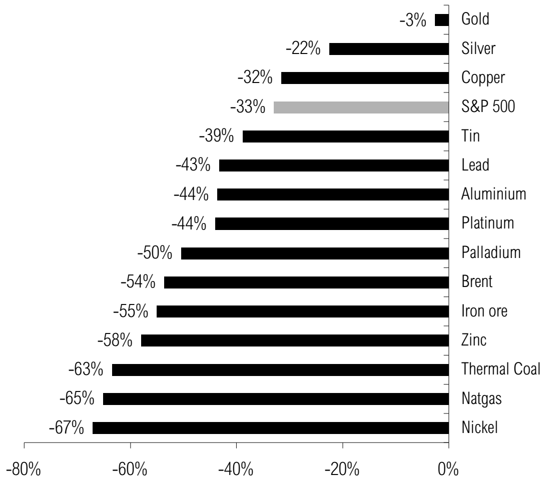
The two charts below provide insight into investor attitudes towards the commodity suite. The chart on the right shows the percentage price declines from commodity cycle price peaks. Note that the top 2 commodities are precious metals. Investors are hanging onto precious metal exposure as a hedge against future inflation and as a play on US dollar weakness. Natural gas and nickel were two of the biggest price boomers caught up in the fund euphoria and remain furthest from their price peaks. We believe the chart on the left should offer comfort. Many of the commodities bottomed in Q4 08 and for those seeking evidence of price stabilisation and a turning point, these impressive increases from their lows should provide comfort that the worst is well and truly over.

Percentage rise in commodity prices from their cycle lows. Impressive gains show worst is behind us



Source: LME, LBMA, Reuters and RBS

Percentage declines from price cycle peaks. Gold has fallen the least, natural gas and nickel the most



Source: LME, LBMA, Reuters and RBS

Forget cutbacks; production restarts have begun

Producer cutbacks have ended and reactivation is now the theme; nickel and aluminium saw the biggest cuts as a percentage of world output

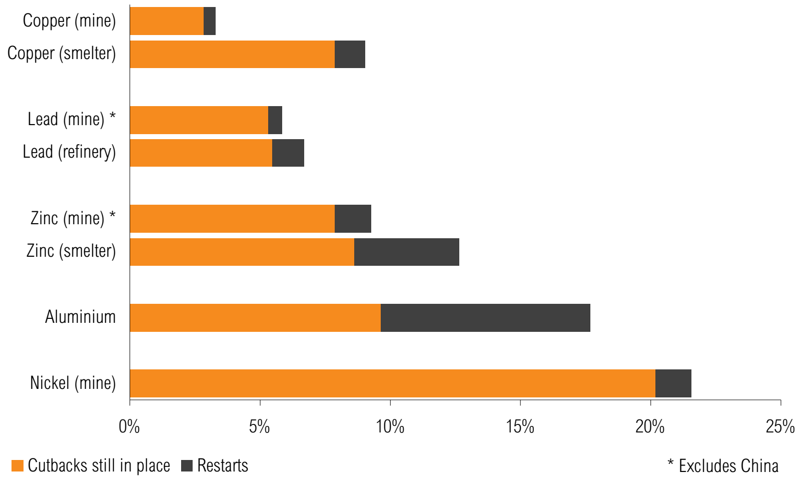
The flood of producer cutbacks in the base metal industry in Q4 08 and Q1 09 slowed to a mere rivulet in Q2 09 as price stabilisation hardened into recovery. Moreover, there were just a handful of further cutbacks in the third quarter, outnumbered by announcements of restarts as prices continued to firm. Even in the second quarter China, which had been in the forefront of the cutbacks, was quietly and not so quietly reactivating capacity across most base metal industries, and it was joined in Q3 by several producers elsewhere.

We prefer demand-induced reactivation, but some producers will not wait and will implement more risky price-induced reactivation

We see some potentially worrying aspects to recent developments. In the first place, **restarts have been induced more by price than by demand**. Chinese stockpiling, which by its nature may be only temporary, played a significant behind-the-scenes role in triggering reactivation within China, and globally, there were still only tentative signs of a pick-up in genuine base metal demand. Second, the restarts paradoxically have been heavily concentrated in one of the most oversupplied markets, aluminium. Third, there remains a huge overhang of closed nickel capacity. Ironically, few of the admittedly modest cutbacks in the fundamentally strongest market, copper mining, have yet been reversed.

Our chart below shows estimates of the capacity cutback since mid-2008 and the reactivation of that capacity, both expressed as a percentage of 2008 world production. Although our figures do not capture big, hard-to-monitor cutbacks and restarts in the Chinese lead/zinc mining industry, aluminium really stands out. We estimate that the proportion of previously closed aluminium smelter capacity (over 7mtpa at its peak) that has now restarted is fast approaching 50%. In aluminium, both cutbacks and restarts have been dominated by China. Our estimates probably do not capture all the mines feeding the Chinese nickel pig iron industry, but the chart shows that there remains a huge overhang of idled nickel mine capacity worldwide, representing c20% of 2008 world output.

Producer cutbacks and restarts as a percentage of 2008 world output – restarts are mounting, stark and worrying differences between the metals



Source: Company releases and RBS

With the exception of copper and perhaps lead, **we would urge producers to be very cautious** about embarking on price-induced as opposed to demand-induced reactivation. For some metals, notably aluminium and nickel, this would risk derailing the impressive recovery seen this year.

The strengthening of commodity currencies such as the rand, Canadian dollar and Australian dollar has pushed up production costs; inflation, too, could become an issue

RBS long-term metal prices raised

We provide two sets of commodity prices, medium term through to 2013 reflecting our market supply-demand balance outlooks. These forecasts are subject to frequent revision reflecting changes in the global economic environment and the dynamics of supply and demand. The second set of longer-term prices are those which we expect to prevail over, say, a 10-year time horizon. Our longer-term real forecasts move less frequently. We try to provide a ballpark price required to bring on new capacity. We have looked at industry cost curves and made an assessment of the currency impact of a weaker US dollar and a more robust inflation profile post 2013 on our long-term prices.

As a rule, long-term prices have tended to decrease over time. Since the 1960s, real prices have tended to decline by around 2% pa. Economies of scale developed as bigger mines and processing facilities were built, technological advances were made and a shift of production to lower-cost labour areas occurred, as well as the type of operation. In copper, an underground sulphide operation will likely have higher costs than an open pit sulphide or a heap leach oxide operation. In the case of nickel ferro – nickel laterite ores are notoriously more expensive than sulphide ores to process. But production costs have been on the increase. Factors have included increased cost of environmental compliance and land rehabilitation; water and air pollutant capture; energy; wages, health care and pension benefits; and adverse currency movements.

RBS long-term price forecasts – these have mostly been raised as production coats have risen reflecting such factors as adverse currency movements on the weaker US dollar, inflation expectations, and wage and power

		Current	Previous	Change (unit)	Change %
Aluminium	c/lb	**110**	110	0.00	0%
	$/t	**2,425**	2,425	0.00	0%
Copper	c/lb	**225**	175	50	29%
	$/t	**4,950**	3,850	1,100	29%
Lead	c/lb	**77**	60	17	31%
	$/t	**1,700**	1,300	400	31%
Zinc	c/lb	**82**	70	12	16%
	$/t	**1,800**	1,550	250	16%
Nickel	$/lb	**6.80**	6.00	0.80	13%
	$/t	**15,000**	13,225	1,775	13%
Tin	$/lb	**6.80**	6.50	0.30	5%
	$/t	**15,000**	14,325	675	5%
Gold	$/oz	**825**	750	75	10%
Silver	$/oz	**13.00**	11.50	1.50	13%
Platinum	$/oz	**1,400**	1,200	200	17%
Palladium	$/oz	**400**	350	50	14%
Iron ore - fines	USc/dltu	**86**	65	21	33%
Thermal coal	US$/t	**65**	55	10	18%
Hard coking coal	US$/t	**100**	86	14	16%

Source: RBS forecasts

RBS checklist for commodity recovery

On the next page we have updated our Commodity Checklist to Recovery of signs needed before we reach the next boom for commodities. Lots more ticks are now in the boxes. There is not one Messianic chart or indicator. The recovery is a process, so we have divided our list into financial, economic and commodity market drivers and arranged them in roughly chronological order, but please view it as a guide to events that may occur as markets work their way through this maelstrom.

RBS Commodity Checklist to Recovery

Financial signals

Resumption of more normal lending a priority and a pre-requisite for a business cycle recovery ☑
Financial arteriosclerosis begins to unblock – letters of credit and resumption of lending ☑
Value investors begin to return to commodity markets/indices ☑
World equity markets find a floor and begin pricing in the business cycle recovery ☑
Commodity currencies (AUD, ZAR, CAD) come back into vogue ☑
Interbank lending rates return to ‘normal’ levels ☑
S&P VIX index falls back from its extreme levels (peaked at 90) to more normal levels below 30 ☑
Cross-asset class selling pressure ends and funds begin to register steady positive fund inflows as risk appetite returns ☑
Key central bank interest rates begin to rise as headline and then core inflation data starts to increase ☐

Economic signals

Pace of growth contraction stabilises ☑
Various key economy PMIs begin to rise as consumer confidence improves ☑
US ISM rebounds ☑
Key economy IP/GDP data series turn positive. Technical recession has ended in the US, Japan, Germany, France, the UK, Sweden and Brazil ☑
Automobile sales begin to recover (spurred by the various ‘cash-for-clunkers’ incentive schemes) ☑
Baltic Dry/Capesize Freight indices make demonstrable rises as ships begin to move cargo as international trade improves ☐
US payroll numbers finally begin to consistently improve and unemployment starts to decline ☐

Commodity market signals

Economic recession causes commodity to demand collapse. Declines yoy are toe-curlingly harrowing ☑
Reported inventories rise alarmingly and stock:consumption ratios rise well away from critical/comfort levels. ☑
Commodity prices slump well below marginal costs of production. Un-crowded bottom cycle trade based upon value and accumulation ☑
Metals and mining companies implement price-induced production cutbacks ☑
Miners slash exploration and capital expenditure budgets and defer/slow-track new projects ☑
Commodity price stabilisation as cutbacks bite, supply surplus contained and funds start value investing in earnest ☑
Precious metals gold, silver, platinum and palladium advance ahead of industrial and bulk commodity prices ☑
Industrial metal prices step up smartly, leaving deep lows well behind as the recovery phase of the pricing cycle occurs ☑
Better prices and improving demand outlook halts production cutback announcements ☑
Oil price recovers, spurred by OPEC constraint, and hopes that world business cycle upturn will stimulate energy usage ☑
Re-stocking by consumers and distributors starts to deplete the inventory pipeline ☑
Exchange inventories finally begin to erode to feed consumer re-stocking and nascent demand ☐
Period of onerous supply surpluses ends and market surpluses diminish and begin to switch from surplus to deficit ☐
Capacity reactivation in full swing, both price and demand induced. Capex spending on the rise. Bubble charts of new projects reappear ☐
Hiatus in price progression (relapse) while market awaits confirmation that price recovery is not a false dawn ☐
Business cycle really gets into its stride and world interest rates begin to rise to combat rising headline and core inflation ☐
Commodity markets bathed in above-trend genuine commodity demand growth. ☐
Stock: consumption ratios fall to critical levels as inventory-draining supply shortfalls occur, spurring prices even higher ☐
Momentum buyers arrive in full force, drinking from the horn of plenty. Backwardations and market squeezes reappear ☐
Bearish analysts are rarer than hen’s teeth and those that survive are like Victorian children: seen but not heard. ☐
End-cycle bull market takes off. Super-cyclists return. Words like ‘paradigm shift’ appear again and miners declare special dividends ☐
Don’t forget to book your ticket to the Bahamas! ☐

Source: RBS

Hallelujah, the world recession is over; economies are already clawing their way out of the abyssal depths; we forecast world GDP growth of 3.6% yoy in 2010, with risks to the upside

RBS world GDP growth forecast of +3.6% yoy for 2010

In the 'Economic Focus' section of this report, the RBS economists offer their thinking on the world macroeconomic outlook. The good news is that since our April report, **countries have been lining up to declare themselves as now out of technical recession.** Europe's two largest economies, Germany and France, set the ball rolling with Japan, the US, Sweden, the UK and Brazil all declaring their recessions over. Our enthusiasm towards the commodity sector derives much support from our expectation that world GDP growth in 2010 will rebound to 3.6% with risks to the upside. Base effect will of course flatter.

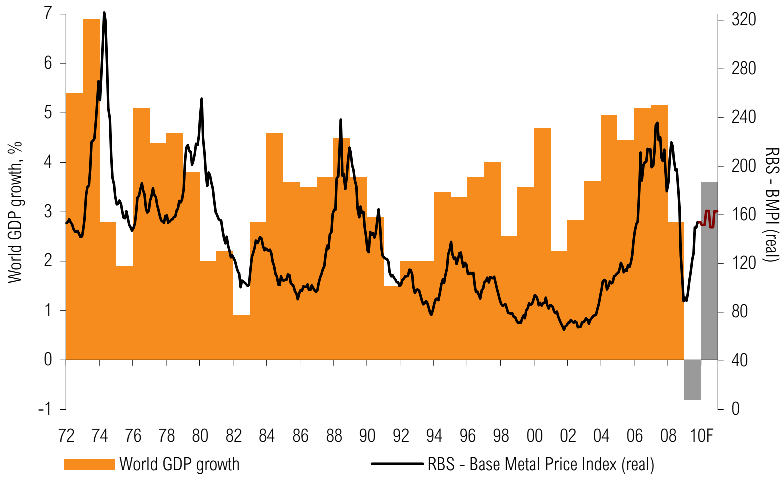
RBS macroeconomic forecast summary, 2008-10F. Worldwide recessions are ending. World GDP growth in 2010 should rebound to at least 3.6%.

% change yoy	2008	2009F	2010F
Real GDP			
US	1.1	**-2.6**	3.2
Euro area	0.6	**-3.8**	0.9
Germany	1.0	**-4.8**	1.3
Japan	**-0.7**	**-5.8**	0.9
China	9.0	8.0	8.0
Asia (ex China & India)	3.1	**-1.1**	4.6
World GDP	**2.8**	**-0.8**	**3.6**
Industrial production			
US	**-2.2**	**-5.6**	3.7
Euro area	**-3.6**	**-13.5**	2.3
UK	**-3.1**	**-9.7**	1.8
Japan	**-3.4**	**-23.0**	13.0
Policy rate (end period)			
US	0.14	0.15	3.00
Euro area	2.50	1.00	1.00
UK	2.00	0.50	1.50
Japan	0.10	0.10	0.10

Source: RBS economic forecasts

The chart below shows the RBS Base Metal Price Index and world GDP growth. It shows how the final fanfare in commodity prices usually comes towards the end of a period of sustained economic growth. Note also the powerful increases in metal prices in the period immediately following recession years. History has repeated itself. **History also shows that prices tend now to relapse.**

World GDP growth and the RBS Base Metal Price Index in real terms. Worst recession in living memory, but metals already in the sunny uplands

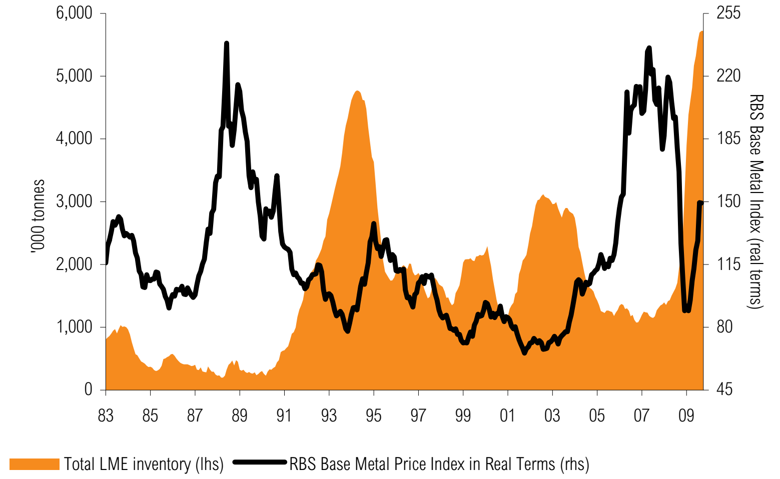


Source: IMF, LME and RBS economic forecasts

LME inventories still at record highs

Total LME warehouse inventories at 5.72mt have now exceeded the previous record high of 4.77mt seen at the end of April 1993. Industry destocking and collapsing consumption have enabled the LME to live up to its mantra of being the market of last resort. Warehouse inventory is now valued at over US$14bn. The good news is that **the pace of inventory accretion is slowing**. Indeed, September saw the lowest level of inventory build in 17 months.

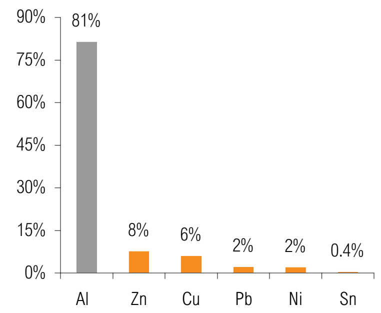
Total LME warehouse inventory is at record levels of 5.72mt – and is dominated by aluminium. Total inventory worth over a record US$14bn



Source: LME and RBS

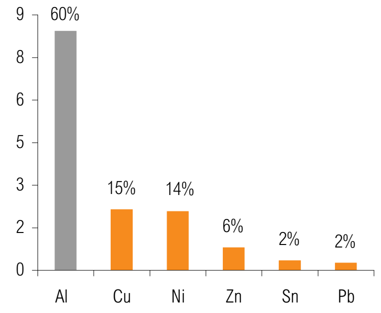
Metal held in LME-registered warehouses is dominated by aluminium holdings. Aluminium accounts for 81% of the inventory tonnage, zinc 8% and copper 6%. In terms of inventory value, aluminium is 60%, copper 15% and nickel 14%.

Aluminium is 81% of total LME inventory and copper just 6%



Source: LME, RBS

But by value, aluminium is 60% with copper 15% (US$bn)



Source: LME, RBS

Contraction in world supply and demand in 2009; shared pain, shared gain as producers rapidly implemented closures; watch out now for across-the-board reactivation

Base metal refined production and consumption should rise in 2010F

Base metal refined production and consumption will contract across the board in 2009, with aluminium showing the worst demand fall, down 7.5% yoy and stainless steel the biggest production slump down 12%. For much of the commodity boom, we had price- and demand-induced capacity expansion and price-induced demand destruction. The phase of price-induced production cuts and the concept of idling swing capacity are also coming to an end. The game now is about reactivation and first mover advantage. We forecast that all metals will show yoy production expansion in 2010, with nickel and stainless steel showing the greatest rises. This should be but the first year of significant production additions from reactivated as well as new and expanded operations.

Base metal annual yoy refined metal production growth, 2006-13F (%)

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	5.9%	12.4%	5.3%	**-6.6%**	4.0%	8.3%	6.5%	6.7%
Copper	4.3%	3.9%	0.9%	**-3.8%**	3.2%	4.2%	4.0%	4.0%
Nickel	5.1%	6.3%	**-3.5%**	**-7.5%**	9.0%	6.5%	9.0%	6.5%
Stainless steel	14.4%	**-1.0%**	**-6.0%**	**-12.0%**	10.0%	9.0%	14.0%	8.0%
Zinc	4.6%	7.3%	2.3%	**-7.0%**	4.6%	6.6%	3.3%	3.2%
Lead	3.5%	2.5%	6.0%	**-4.1%**	4.2%	4.7%	4.2%	4.8%

Source: CRU, RBS forecasts

Our estimates of metal consumption post 2009 have remained robust. We still expect the economically geared metals aluminium and nickel to register the strongest growth at 10% pa in 2010 and well above trend growth in 2010-13F. We also envisage a strong measure of consumer and distributor restocking in 2010, which will flatter the yoy numbers as well as a base effect phenomenon. The declines in 2009 were every bit as bad as the 1980-82 post-oil-shock recession.

Base metal annual yoy world consumption growth, 2006-13F (%)

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	8.0%	10.0%	**-1.2%**	**-7.5%**	10.0%	10.0%	8.0%	7.0%
Copper	3.2%	3.8%	**-1.7%**	**-6.0%**	7.0%	6.0%	4.2%	3.8%
Nickel	12.0%	**-4.5%**	**-5.0%**	**-3.0%**	10.0%	8.0%	13.5%	8.0%
Zinc	5.2%	2.0%	**-0.5%**	**-6.3%**	7.1%	6.7%	5.8%	4.3%
Lead	4.1%	1.5%	2.7%	**-2.7%**	4.9%	5.2%	4.7%	4.5%

Source: CRU and RBS forecasts

All the base metals markets in supply surplus in 2008-09

Hefty supply surpluses in 2008-10, but 2011 should see transition towards the first supply deficits, notably copper and lead; by 2012 all markets should be in deficit

The following tables provide summaries of our implied supply/demand market balances through to 2013F and the derived stock consumption ratios. We highlight periods of supply deficit in bold. The world supply deficits of 2006 were progressively replaced in 2007-09 by supply surpluses. We can't even begin to think what state the industry would be in had aggressive cutbacks not been made. We forecast that 2011 will be a transition year to the better, with supply surpluses diminishing and shortfalls reappearing. By 2012, all the metals should be in price-supporting supply deficit.

Implied world base metal supply/demand balances, 2006-13F. Markets have migrated from supply deficits in 2006 to supply surpluses

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	**-620**	150	2650	2850	850	300	**-250**	**-500**
Copper	**-120**	**-110**	360	750	150	**-150**	**-200**	**-200**
Nickel	**-60**	90	105	45	35	15	**-45**	**-75**
Zinc	**-390**	145	460	350	100	100	**-200**	**-350**
Lead	**-160**	**-85**	175	50	0	**-50**	**-100**	**-75**

Source: CRU and RBS forecasts

The table below shows total industry inventories expressed in terms of weeks of consumption. The stock ratio rose sharply in 2008, notably for aluminium and nickel, the two more economically geared metals, and we forecast that the stock ratios will peak by the end of 2010. Based on our demand forecasts for 2010, in the case of aluminium, one week of stock equates to 0.665mt, for copper 0.340mt, for zinc 0.215mt and nickel 0.025mt.

Base metal market stock consumption ratios, 2006-13F (weeks of stock). These have rapidly moved from below critical levels to above comfortable

	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
Aluminium	4.0	3.8	6.3	10.0	9.5	8.5	7.5	6.5
Copper	3.4	2.9	3.4	3.6	4.1	3.6	3.2	2.8
Nickel	5.7	7.8	10.4	12.6	12.2	12.0	9.0	6.2
Zinc	2.6	2.9	3.8	5.2	5.8	6.3	5.3	4.0
Lead	1.7	1.7	1.9	2.5	2.7	2.3	1.9	1.6

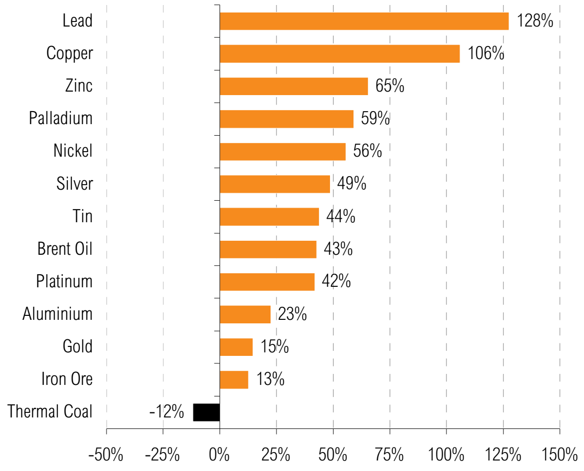
Source: LME, ICSG, ILZSG, ICSG, IAI and RBS estimates and forecasts

Weaker US dollar currency impact has been dramatic

The world has now moved away from a strong US dollar environment. Indeed, the trade-weighted US dollar begins Q4 09 at its lowest level in over 12 months. The two charts below show the impact of the weaker US dollar on a suite of spot commodity prices. We have chosen the South African rand as our example, but a similar though less extreme picture emerges for the Canadian and Australian dollars.

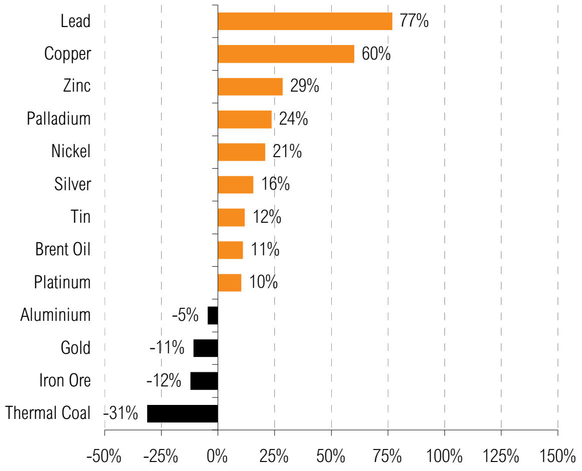
The charts show that the percentage gains in commodity prices when translated into local currency terms are dramatically lower. South African miners with costs in appreciating rand (not to mention higher wage settlements and Eskom power tariffs) but product revenues in weaker US dollars face a tough margin squeeze.

Gains in our commodity suite since end 2008 in US dollars have been eye-catching...



Source: Bloomberg and RBS

… but in stronger South African rand the gains are lower and indeed some gains have turned to losses



Source: Bloomberg and RBS

The value and accumulation trade now completed

Risks remain, such as a relapse in the pace and magnitude of the economic recovery; that producers prematurely reactivate too much idled capacity; the ending of Chinese SRB buying and even perhaps stockpile selling, prompts a sell-off

In 2008, with the exception of gold, every one of the key traded commodities experienced significant price declines of 30-60%. By year-end, commodities had fallen so far and so deep into industry cost curves that they offered financial funds a bargain basement entry opportunity. Philanthropy is not a feature of the mining industry and by and large, miners are not going to produce at a loss for too long. That said, there has been an element of shared-pain, shared-gain about this cycle.

Given the often extreme price volatility and daily moves of above 5% for a metal are not uncommon, entry into the commodity space in Q4 08 was very much for the brave hearted and it was all about executing **the bottom of the cycle trade.** This tends not to be a crowded trade, but one where given the oversold nature of commodities; longer-term investors are attracted by **value** and the **opportunity to accumulate** exposure. Those who this year have followed the risk trade rather than the economic trade have been handsomely rewarded.

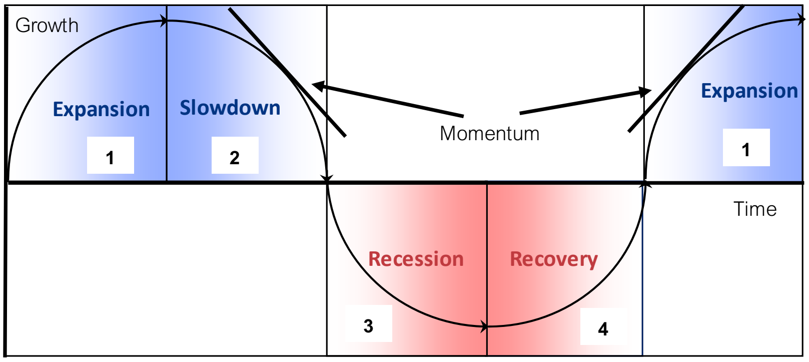
Commodity markets are now entering **the twilight zone,** where the baton has to be handed over from hope and anticipation to genuine economic demand pull as the business cycle recovers. It becomes more and more a macroeconomic trade as the business cycle moves into recovery and expansion. This is about **momentum and value stretch** and will become a much more crowded trade.

We are now in the recovery phase of the business cycle

As we said earlier, for commodity markets, 2009 has all been about recovery in prices from dismally low levels, levels that were deep into industry cost curves and in which huge swathes of the industry were losing money. By definition, economic commodity production must be **that which can be extracted/produced at a profit** (some state-owned enterprises seem to operate for quota and have a subtle shift along the lines of merely **that which can be extracted**). It has been about recession in key developed world economies and temporary bridges to stimulate growth, not very much about the macroeconomic environment. **This is now changing. It is now all about the macro.**

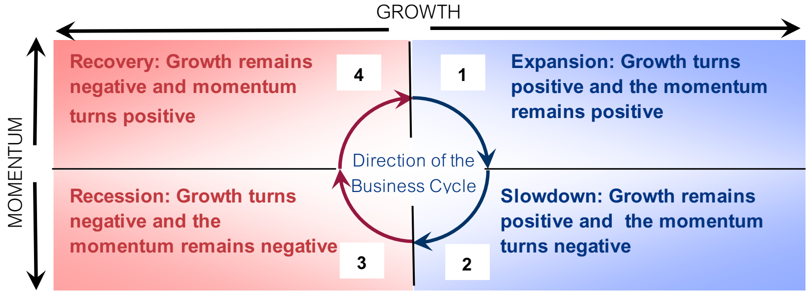
So where are we in the business cycle? The two diagrams below are from the **RBS Business Cycle Screener** published by our colleagues in European Economics. Commodity markets have – correctly in our opinion – this year been discounting that the world business cycle is moving from Recession Red Phase 3 into Recovery - Red Phase 4. As shown in our explanatory boxes below, Phase 4 is when growth remains in negative territory but momentum turns positive.

The four phases of a typical business cycle. Many economies have now declared the technical recession over. Now in Phase 4 - Recovery



Source: RBS

RBS Business Cycle Screener: Dynamics of the four different phases of a typical business driven by Growth and Momentum


GROWTH
MOMENTUM
Recovery: Growth remains negative and momentum turns positive
4
1
Expansion: Growth turns positive and the momentum remains positive
Direction of the Business Cycle
Recession: Growth turns negative and the momentum remains negative
3
2
Slowdown: Growth remains positive and the momentum turns negative

Source: RBS

Crucially, although the phases of this cycle have been pretty much textbook, the speed at which the slowdown and recession phases have completed their moves has been staggeringly swift. In our January *Commodity Companion*, “Metamorphosis”, we noted that historically, base metal prices as represented by the RBS Base Metal Price Index have taken 41 months to move from peak to trough. **This time around, that journey was achieved in just nine months from March to December 2008 – a telescoped cycle.** But look at the symmetry. It has also taken just nine months for our index to rise 70%, recapturing half its losses. Meanwhile, governments around the world are declaring their recessions (as defined as two consecutive quarters of negative GDP growth) over.

London Metal Exchange Week 12 October − coming into focus

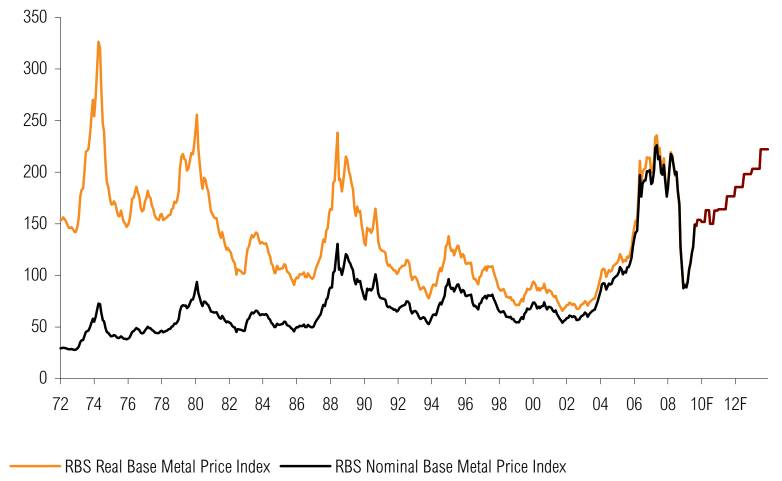
It's that time of year again for the annual LME Week, kicking off what is known affectionately in the metals world as the "mating season". LME Week this year begins on Columbus Day, Monday 12 October, and will see thousands of commodity producers, consumers, traders, analysts and media descend on London for a week-long festival of metal markets and their outlooks. It provides an opportunity for crystal ball gazing into 2010. It will be held in a much better price and financial environment to that of October 2008, when the world was already sliding into the depths of the recession. With just three months of the year remaining, 2009 should go down as a banner year for commodities, a year in which gold spent its longest period above the US$1,000/oz marker and a year in which many of the world's key commodities – oil, copper, lead and nickel – doubled in price during the worst recession in living memory.

The chart below shows the RBS Base Metal Price Index in real and nominal terms and our forecast (in red) for the index. The message is that base metals have had their very own V-shaped price recovery. We forecast that in common with previous price cycle recoveries, which relapsed after 7-9 months, commodities in general are likely to pause for breath while the fundamentals catch up with the business cycle recovery. It will be crucial for real demand in western developed world economies to flourish and compensate for the ending of temporary stimulus packages and Chinese stockpiling. **The path of the US dollar, attitudes to risk appetite and the macroeconomic outlook are now the three key common denominators for the commodity complex.**

If our forecasts are fulfilled, then commodity prices of base and precious metals through to bulks and energy appear set to enjoy handsome gains through to 2013. We forecast the RBS Base Metal Price Index will track essentially sideways and rise around 17% in US dollar terms by Q2 11 as producer reactivation delivers hundreds of thousands of tonnes of commodities into world markets. This phase will coincide with fears of economic growth relapse and with a number of financial and economic headwinds such as higher taxes, hefty cuts in government capital spending programmes and of course rising interest rates.

Beginning in H2 11, we expect commodity markets to get truly into their stride. Supply deficits should re-emerge; inventories should be drawn down; capacity utilisation rates should rise to high levels; freight rates should rise sharply and all the ingredients should then be in place for a good old-fashioned bull market. We forecast a 35% rise in the RBS Base Metal Index from H1 11 to H2 13, providing an overall rise in our index from current to end-2013 of an impressive 60%.

Metals have experienced a telescoped price cycle and have had their very own V-shaped recovery. Time now to pause for breath before greater glory



Source: IMF, LME, RBS forecasts

RBS annual commodity price actuals and forecasts, 2008-13F

		2008A	2009F	2010F	2011F	2012F	2013F	LT
Base metals								
Aluminium	US¢/lb	117	75	90	100	115	130	**110**
	US$/t	2,571	1,645	2,000	2,200	2,525	2,875	**2,425**
Copper	US¢/lb	315	230	305	330	375	410	**225**
	US$/t	6,951	5,075	6,750	7,250	8,250	9,000	**4,950**
Lead	US¢/lb	95	77	102	109	115	125	**77**
	US$/t	2,084	1,700	2,250	2,400	2,525	2,750	**1,700**
Zinc	¢/lb	85	72	92	98	109	116	**82**
	US$/t	1,870	1,585	2,025	2,150	2,400	2,550	**1,800**
Nickel	US$/lb	9.53	6.67	7.05	7.95	8.75	10.45	**6.80**
	US$/t	21,020	14,700	15,500	17,500	19,250	23,000	**15,000**
Tin	US$/lb	8.39	6.25	7.25	7.80	8.05	8.15	**6.80**
	US$/t	18,487	13,775	16,000	17,250	17,750	18,000	**15,000**
Precious metals								
Gold	US$/oz	872	950	1,000	975	1,000	1,150	**825**
Silver	US$/oz	14.99	14.50	17.50	16.00	16.75	19.00	**13.00**
Platinum	US$/oz	1,572	1,200	1,450	1,550	1,600	1,800	**1,400**
Palladium	US$/oz	351	250	350	400	475	650	**400**
Bulks								
Fe - fines	US¢/dltu	147	99	108	117	105	94	**86**
Fe - lump	US¢/dltu	205	114	125	135	124	112	**102**
Coal - Hard coking	US$/tonne	305	128	150	150	145	145	**100**
Coal - Semi soft coking	US$/tonne	240	79	84	87	92	84	**74**
Coal - LV PCI	US$/tonne	245	86	98	98	90	90	**80**
Coal - Thermal	US$/tonne	125	69	75	78	80	83	**65**
Oil & Natural Gas								
WTI Crude Oil	US$/bbl	99.75	62	78	85	90	100	**100**
Brent Crude Oil	US$/bbl	98.52	63	79	87	92	102	**102**
Henry Hub Natural gas	US$/MMBtu	8.90	4.25	6.25	6.50	6.75	7.00	**7.00**
Uranium	US$/lb	63.4	47	59	83	83	65	**65**

Annual yoy percentage changes in actual and RBS commodity price forecasts, 2008-13F

	2008A	2009F	2010F	2011F	2012F	2013F
Base metals						
Aluminium	**-3%**	**-36%**	22%	10%	15%	14%
Copper	**-2%**	**-27%**	33%	7%	14%	9%
Lead	**-20%**	**-18%**	32%	7%	5%	9%
Zinc	**-42%**	**-15%**	28%	6%	12%	6%
Nickel	**-43%**	**-30%**	5%	13%	10%	19%
Tin	27%	**-25%**	16%	8%	3%	1%
Precious metals						
Gold	25%	9%	5%	-3%	3%	15%
Silver	12%	-3%	21%	-9%	5%	13%
Platinum	21%	-24%	21%	7%	3%	13%
Palladium	-1%	-29%	40%	14%	19%	37%
Bulks						
Fe – fines	80%	**-33%**	10%	7%	**-10%**	**-10%**
Fe - lump	97%	**-44%**	10%	8%	**-8%**	**-10%**
Coal - Hard coking	211%	**-58%**	17%	0%	**-3%**	0%
Coal - Semi soft coking	281%	**-67%**	6%	4%	5%	**-8%**
Coal - LV PCI	263%	**-65%**	14%	0%	**-8%**	0%
Coal - Thermal	125%	**-45%**	9%	3%	3%	3%
Oil & Natural Gas						
WTI Crude Oil	38%	**-38%**	26%	10%	6%	11%
Brent Crude Oil	36%	**-36%**	26%	9%	6%	11%
Henry Hub Natural gas	25%	**-52%**	47%	4%	4%	4%

Source: LME, LBMA, LPPM, TEX, NYMEX, RBS forecasts

RBS quarterly average commodity price forecasts, 2009-10F

		2009F					2010F				
		1QA	2QA	3QA	4QF	**2009F**	1QF	2QF	3QF	4QF	**2010F**
Base metals											
Aluminium	US¢/lb	62	67	82	87	**75**	85	95	85	95	**90**
	US$/t	1,360	1,488	1,806	1,925	**1,645**	1,900	2,100	1,900	2,100	**2,000**
Copper	US¢/lb	156	212	265	290	**230**	295	320	295	320	**305**
	US$/t	3,435	4,675	5,839	6,350	**5,075**	6,500	7,000	6,500	7,000	**6,750**
Lead	US¢/lb	53	68	87	101	**77**	102	107	98	102	**102**
	US$/t	1,159	1,505	1,924	2,225	**1,700**	2,250	2,350	2,150	2,250	**2,250**
Zinc	US¢/lb	53	67	80	87	**72**	88	95	88	95	**92**
	US$/t	1,173	1,475	1,756	1,925	**1,585**	1,950	2,100	1,950	2,100	**2,025**
Nickel	US$/lb	4.74	5.89	8.00	8.05	**6.67**	7.25	7.05	6.60	7.25	**7.05**
	US$/t	10,455	12,986	17,608	17,750	**14,700**	16,000	15,500	14,500	16,000	**15,500**
Tin	US$/lb	5.00	6.14	6.60	7.25	**6.25**	7.05	7.50	7.05	7.50	**7.25**
	US$/t	11,012	13,538	14,563	16,000	**13,775**	15,500	16,500	15,500	16,500	**16,000**
Precious metals											
Gold	US$/oz	908	922	960	1,010	**950**	1,050	1,000	950	1,000	**1,000**
Silver	US$/oz	12.60	13.76	14.69	17.00	**14.50**	18.50	17.50	16.50	17.50	**17.50**
Platinum	US$/oz	1,023	1,172	1,230	1,375	**1,200**	1,400	1,450	1,450	1,500	**1,450**
Palladium	US$/oz	199	234	272	295	**250**	325	350	350	375	**350**
Oil & Natgas											
WTI Crude Oil	US$/bbl	43	60	68	75	**62**	75	75	80	80	**78**
Brent Crude Oil	US$/bbl	46	60	69	77	**63**	77	77	82	82	**79**
Henry Hub Natural gas	US$/MM Btu	4.47	3.81	3.44	5.25	**4.25**	5.75	6.25	6.50	6.50	**6.25**

Half-year average price assumptions, 2009-13F

		2009F		2010F		2011F		2012F		2013F	
		1HA	2HF	1HF	2HF	1HF	2HF	1HF	2HF	1HF	2HF
Base metals											
Aluminium	US¢/lb	65	85	90	90	95	105	110	120	125	135
	US$/t	1,424	1,865	2,000	2,000	2,100	2,300	2,425	2,625	2,750	3,000
Copper	US¢/lb	185	278	308	308	320	340	365	385	385	430
	US$/t	4,055	6,095	6,750	6,750	7,000	7,500	8,000	8,500	8,500	9,500
Lead	US¢/lb	60	94	105	100	107	111	111	118	120	125
	US$/t	1,332	2,075	2,300	2,200	2,350	2,450	2,450	2,600	2,700	2,800
Zinc	US¢/lb	60	84	92	92	95	100	107	111	115	120
	US$/t	1,324	1,841	2,025	2,025	2,100	2,200	2,350	2,450	2,500	2,600
Nickel	US$/lb	5.30	8.03	7.15	6.90	7.50	8.40	8.40	9.05	10.00	10.90
	US$/t	11,721	17,679	15,750	15,250	16,500	18,500	18,500	20,000	22,000	24,000
Tin	US$/lb	5.55	6.93	7.25	7.25	7.70	7.95	7.95	8.15	8.30	8.05
	US$/t	12,275	15,281	16,000	16,000	17,000	17,500	17,500	18,000	18,250	17,750
Precious metals											
Gold	US$/oz	915	985	1,025	975	1,000	950	1,000	1,000	1,100	1,200
Silver	US$/oz	13.18	15.85	18.00	17.00	16.50	15.50	16.50	17.00	18.00	20.00
Platinum	US$/oz	1,098	1,303	1,425	1,475	1,600	1,500	1,600	1,600	1,700	1,900
Palladium	US$/oz	217	284	338	363	400	400	450	500	600	700

Source: LME, LBMA, LPPM, TEX, NYMEX, RBS forecasts

Changes in RBS commodity price forecasts since our April 2009 Commodity Companion - *Bridge over troubled water*

	2009F	2010F	2011F	2012F	LT
Base metals					
Aluminium	6%	7%	5%	-1%	0%
Copper	21%	23%	21%	25%	29%
Lead	27%	45%	41%	29%	31%
Zinc	11%	9%	2%	4%	16%
Nickel	27%	17%	18%	17%	13%
Tin	12%	9%	15%	13%	5%
Precious metals					
Gold	0%	0%	8%	18%	10%
Silver	10%	23%	28%	49%	13%
Platinum	0%	4%	19%	33%	17%
Palladium	0%	0%	0%	36%	14%
Bulks					
Fe - fines	0%	5%	5%	5%	33%
Fe - lump	0%	-2%	-2%	3%	0%
Coal - Hard coking	0%	15%	11%	12%	16%
Coal - Semi soft coking	1%	3%	2%	2%	18%
Coal - LV PCI	0%	11%	5%	0%	14%
Coal - Thermal	0%	7%	3%	0%	18%
Oil & Natural gas					
WTI Crude Oil	37%	41%	13%	20%	33%
Brent Crude Oil	35%	41%	14%	20%	34%
Henry Hub Natural gas	0%	4%	n/a	n/a	8%

Source: RBS forecasts

Economic focus

Economics editor
Jacques Cailloux
Chief European Economist
jacques.cailloux@rbs.com
+ 44 207 085 4757

No straight line to sustained expansion

Economics - contents

	Page
Key economics and FX forecasts	24
Regional updates	
United States	25
Euro area	27
Japan	29
Non-Japan Asia	30
FX	31
China Special	32

Q3 09 back to expansion: Q3 GDP reports and the earnings season is still a month away but the evidence available to date suggest that **G7 GDP will be up around 2.5% q/q annualised**. This would follow deepest and longest post war contraction of close to 6% on average over the previous 3 quarters. Q3 G7 GDP is now forecast to be a little stronger than was the case a month ago, as the upside risks we had highlighted in Europe have materialised.

However, in light of the contraction experienced, this would still be a relative modest expansion, leaving G7 output close to 4% lower than a year ago. With the global economy having successfully returned to positive growth in Q3, the focus remains squarely on its ability to sustain any expansion into next year. Importantly, we expect the economic news flow to become more mixed over Q4, a development which will no doubt leave the debate about the shape of the recovery wide open.

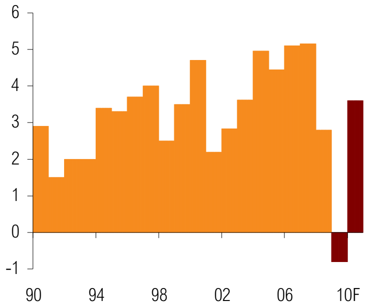
Fears of double dip to regain traction momentarily: Our view that the probability of double dip is low remains unchanged. At the same, we recognise that the path to sustainable recovery is unlikely to be a straight line. The first important test to that view will come in the coming weeks as we expect a temporary slowdown in the pace of expansion in G7 output in Q4. This forecast is largely based on the idea that part of the expansion in Q3, especially in the US, was borrowed from Q4/Q1. A temporary contraction in US consumer spending in Q4 – which remains our base case scenario – will likely be the most significant bad news to digest for the market as this will no doubt revive fears of a double dip.

The end of the "cash for clunkers" and of the homebuyer tax credit (expiring on November 30th) are the main culprits behind this moderation in growth in Q4. Europe also appears to be exposed in the short term to the phasing out of the car scrappage incentive schemes which is expected to dampen euro area GDP in Q4 relative to Q3.

Road to sustainable recovery unlikely to be a straight line: Navigating through what we believe is going to be a much more mixed batch of economic data will not be easy. In that context, labour market developments will become the most relevant gauge to assess how sustainable the recovery will be. The key signposts are in the US, a bottoming out of the contraction in payrolls over Q4 and in Europe a further slow down in the pace of increase in unemployment. Should labour market developments depart significantly from our expectation, we would be forced to reassess our forecast for H1.

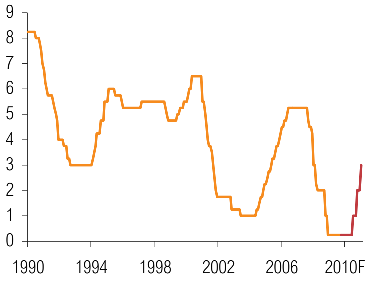
RBS economics, rates and FX forecasts

RBS world GDP growth forecast % change yoy. Rebound on its way



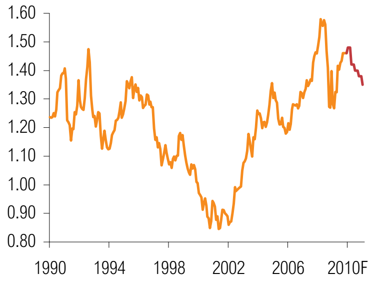
Source: IMF, RBS forecasts

Federal funds target rate %



Source: Bloomberg, RBS forecasts

EUR/USD



Source: Bloomberg, RBS forecasts

	2006	2007	2008	2009F	2010F
Real GDP - Calendar % ch YOY					
US	2.8	2.0	1.1	**-2.6**	3.2
Japan	2.0	2.4	**-0.7**	**-5.8**	0.9
China	11.6	13.0	9.0	8.0	8.0
Euro area	3.0	2.6	0.6	**-3.8**	0.9
UK	2.9	3.0	0.6	**-4.3**	1.5
World GDP	**5.1**	**5.2**	**2.8**	**-0.8**	**3.6**
Industrial production - % change YOY					
US	1.3	2.0	**-2.2**	**-5.6**	3.7
Euro Area	5.0	1.7	**-3.6**	**-13.5**	2.3
UK	0.5	1.0	**-3.1**	**-9.7**	1.8
Japan	5.4	2.9	**-3.4**	**-23.0**	13.0
Consumer Price Inflation – headline - end year, % change YOY					
US	3.23	2.00	3.8	1.2	2.6
Japan	0.25	0.06	1.4	**-1.4**	**-1.4**
China	1.47	4.77	5.9	**-0.9**	2.0
Euro area	2.18	2.13	3.3	0.3	1.1
UK	2.3	2.3	3.6	2.1	2.0
World	**3.5**	**3.8**	**4.7**	**1.6**	**2.3**
Policy rate - end year, %					
US	5.25	4.25	0.14	0.15	3.00
Japan	0.25	0.50	0.10	0.10	0.10
Euro Area	3.50	4.00	2.50	1.00	1.00
UK	5.00	5.50	2.00	0.50	1.50

Key commodity currency - FX forecasts – end period

	Q3 09	Q4 09	Q1 10	Q2 10	Q3 10	Q4 10	Q1-11	Q2-11
Rates per US dollar								
AUD*	0.86	0.89	0.86	0.84	0.82	0.80	0.78	0.78
CAD	1.08	1.02	1.00	1.05	0.99	0.98	1.02	1.04
ZAR	7.60	8.00	9.00	9.00	8.70	8.60	8.60	8.60
CLP	553	540	550	580	550	500	490	490
CNY	6.83	6.80	6.70	6.60	6.50	6.40	6.30	6.20
INR	48.6	43.0	44.0	45.0	45.0	46.0	47.0	48.0
RUB	30.7	36.0	37.0	36.0	35.0	35.0	34.0	34.0
TRY	1.50	1.55	1.65	1.57	1.55	1.53	1.62	1.67
JPY	91	91	89	90	93	96	99	102
GBP*	1.67	1.66	1.62	1.63	1.68	1.71	1.62	1.62
Rates per euro								
USD	1.46	1.48	1.42	1.40	1.38	1.35	1.28	1.26
JPY	133	135	126	126	128	130	127	129
GBP	0.87	0.89	0.88	0.86	0.82	0.79	0.79	0.78

Source: RBS forecasts

* Currency at head column per currency at end row

US

Stephen Stanley
Chief US Economist
stephen.stanley@rbs.com
+1 203 897 2818

Minding our levels and changes

There are instances when the economy is especially difficult to forecast, most notably around turning points. The present situation is particularly tricky, even for a turning point, for a variety of reasons. This recession has been the longest and most severe since the 1930s, and has included a major financial sector crisis that has not been entirely resolved. Thus, at this stage, there are very few appropriate precedents to fall back on, especially since the only two recessions in the past 25 years were both extraordinarily shallow and short, followed by extended periods of halting, sub-par growth.

One distinction that is absolutely critical is the difference between levels and changes. This sounds simple enough, but judging from the discussions in the markets over the past few months, it has proven quite difficult. This distinction is most critical when coming out of a recession, especially a deep one, since the level of activity is low (disastrously so in the current episode) and will remain so for quite some time no matter how fast the economy recovers. It may seem paradoxical to some, but the lower the level of activity, the more vigorously growth can (and should) rebound to bring the economy back toward equilibrium. Indeed, this idea is embodied in the so-called Zarnowitz rule (named after Victor Zarnowitz): deep recessions are almost always followed by rapid rebounds.

The Zarnowitz rule amounts to empirical support for a V-shaped recovery, but there is widespread skepticism that the economy will be able to generate momentum, even from the current depressed levels of activity. Indeed, even our relatively optimistic forecast falls well short of a full-fledged V-shaped recovery (in the 1970s and 1980s, recessions that were severe but less so than the latest one were followed by bursts of around 6% real growth in the first year of recovery). Still, we believe that at least some of the pessimism currently being exhibited regarding the forthcoming recovery reflects confusion between levels and changes. In particular, because the focus is almost always on changes (we typically think about output in terms of GDP growth, about prices in terms of inflation, and employment in terms of the change in payroll jobs), many ideas these days are being applied to changes that more appropriately should be thought about in level terms.

Two concepts may help to clarify the distinction

1. Activity will be depressed for a long time but growth can be explosive. Having contracted by about 4% over the past 18 months, the economy stands at incredibly low levels of activity, as illustrated by an unemployment rate nearing 10% and a capacity utilisation rate below 70%.

Indeed, in a variety of sectors, the level of activity swooned to an unsustainably depressed level in early 2009, as businesses and households were paralysed by uncertainty amid a financial and economic crisis. The best example is residential construction, but a similar story can be told to varying degrees for other sectors, such as auto sales and business investment in equipment and software.

Changes in production (ie output) tend to be even more volatile than demand coming out of a deep recession due to the inventory cycle. In the early stages of a recession, firms tend to be caught flat-footed, and they do not adjust output downward fast enough to keep up with weakening sales. At some point in the cycle, businesses slash production to a level that is even lower than the depressed pace of sales (eg the automakers in the spring).

The early stages of a recovery often involve the sharp adjustment of output back into line with demand once inventories are brought under control. This dynamic is playing out now and will likely provide a significant chunk of (if not the majority of) growth in H2 09. This dynamic has historically represented an important part of the patterns behind the Zarnowitz rule. In short, it is dangerous to think in terms of changes at the bottom of a recession, when the level of demand is unsustainably low and output is depressed relative to that demand.

2. 'New normal' and potential growth rates. A related misconception is that growth must be tepid due to the headwinds facing the economy (rising savings rates, tight credit, etc). Debate has been lively about whether the potential/trend growth rate of the economy will be noticeably lower than before, but the problem is that many market participants are applying a lower trend rate of growth (the change argument) to the current low level of activity.

Inevitably, a recession takes the level of activity below the long-term trend. In severe recessions, output tends to fall well below trend. A variety of observers has suggested that the recovery will be sluggish because trend growth will be slower than before. The problem is that many look for growth to settle into this sluggish pattern right away.

The problem with this view is that **it skips the recovery phase of the cycle,** leaving the level of activity permanently depressed relative to trend. History clearly shows that following deep recessions, there has always been a period of above-trend growth that helps speed the economy along back to equilibrium (ie trend). This was true even in the Great Depression in the US and during the 1990s in Japan. In the wake of the most severe recession since World War II, this necessitates a substantial rebound at some point. To be sure, there can be legitimate debate about the timing and pattern of a recovery (ie whether it will be shaped like a V, a U, or even a W), but there will be a strong recovery period.

One can plausibly argue that the potential rate of GDP growth will be noticeably lower going forward than it was before. We are sceptical of this view, believing the long-term trend growth rate should be determined predominantly by the pace of advances in productivity and the labour force, neither of which should be affected much by the sorts of negative forces cited as headwinds. Nevertheless, even if the potential growth rate is lower going forward, the economy is still currently operating far below its potential and will need to see a substantial initial burst in the process of getting back to its trend level.

Third-quarter GDP update

Since late August, RBS's Q3 real GDP forecast has improved somewhat. Our headline growth estimate has inched up from a 2.5% annualised pace to around 2.8%, but this has occurred even as we project bigger drags from inventories and trade than we were previously assuming. Real consumer spending may advance somewhat faster in Q3 than previously thought, but the bigger story over the past month has been the upgrades in the housing and capital equipment sectors.

These categories of GDP both posted contractions of close to 40% annualised in Q1 (-39.2% and -43.6%, respectively), but based on surprisingly robust monthly data, now seem poised to move into positive territory in Q3. In addition, beyond the current period, we have nudged up our growth forecasts for Q4 and most of 2010. Our estimates still are nowhere near a full-fledged V-shaped recovery (at least as we would define it), but the string of stronger-than-expected economic releases over the last few months has underscored our conviction that the economy will expand at a well-above-trend pace in 2010.

Euro area

Jacques Cailloux
Chief European Economist
jacques.cailloux@rbs.com
+ 44 207 085 4757

Beware of the hawks

The relative country performance over the quarter is likely to show Germany growing most since March 2008 (we forecast +1% q/q) followed by France (+0.4% q/q). Countries such as Italy and Spain are still expected to perform poorly moving from contraction in Q2 to about stagnation in Q3. According to our new GDP indicator (*see On track for Q3 growth | RBS GDP Tracker: euro area*), the improvement should come mostly from an increase in manufacturing output of about 1.5% q/q, the first increase since Q1 2008.

End of car scrappage schemes unlikely to jeopardise recovery

The outlook for Q4 09 is positive with industrial production likely to be yet again the prime driver. The key short term uncertainty is related to the end of the vehicle scrappage programmes in some euro area countries and in particular in Germany. Euro area car sales were up about 12% in Q2 q/q (4.5% y/y) and will likely be slightly positive in Q3. Some softening in car sales in Q4 is quite likely although it is unlikely that they will fall off a cliff. Indeed, a number of countries have already stated that they will try and smooth the phasing out of these pragmatic incentive schemes.

To date, France has already said that its programme will continue into 2011 to avoid any major collapse in car sales whilst the UK has extended its scheme to embrace a further 100,000 vehicles. Meanwhile, Italy is said to be readying an extension of its scrapping plan which was launched in May if there were signs of plunging sales at the end of the year when the programme is due to elapse.

In Spain, the government programme to subsidise new purchases was implemented in May and seems to have started having a positive impact only in September (with industry reports suggesting a rise in car sales of about 10% y/y). The programme was designed to run for a year or up to a budget of 100 million. At the end of September, about 40% of the funds had been used suggesting no imminent need to increase the programme.

So the key uncertainty comes from Germany. Its scrappage scheme which was the first to be implemented in the euro area expired earlier this month. The programme is said to have boosted car sales by 2 million unit. However, although the subsidy is now closed, the government is allowing delayed deliveries under the scheme through into 2010.

Labour market is turning

The euro area labour market turned at the end of Q1 when unemployment rose by 1.3 million, the largest increase since the 1992 recession. Since then the pace of increase in joblessness has been declining steadily. In the 3 months to July, euro area unemployment rose by 500k almost a third of the increase in Q1.

The euro area labour market adjustment has been most unusual with for example, 60 % of the increase in euro area unemployment since the beginning of 2008 entirely explained by the end of short term contracts in the Spanish construction and manufacturing sectors! On the other extreme, the German labour market has seen one of the smallest deteriorations across the region despite the fact that the German economy is experiencing one of the largest contractions in output in the euro area. This very unusual development is related to the short time allowance programme which currently has around 1.2 million participating employees. This programme has proven very efficient in providing firms with a high degree of flexibility to navigate through the downturn by slashing hours worked rather than employment. We disagree with the consensus view which expects a sudden massive deterioration in the German labour market as labour costs remain high and demand remains weak. Indeed, the programme has been extended for the second time to 2011 and there are early signs that firms are actually scaling back their restructuring plans. This suggests that the unemployment rate in Germany is unlikely to rise by as much as people fear. At the same time hours worked will have first to rise very significantly before any meaningful hiring can take place. This is true in particular for the manufacturing sector but less the case in the services sector.

A turning point in the labour market at this time of the recovery suggests that the chances of double dip remain low.

ECB rhetoric to gradually shift to a more hawkish stance

We have been arguing since the ECB September meeting that the rhetoric of the ECB will not get any more dovish from here. We remain of that view. At this stage, the Council has spoken with one voice claiming that the recovery remains unsustainable.

In the coming months, this rhetoric is likely to evolve with the usual more hawkish members likely to depart from the consensus. In particular, we expect the Bundesbank to strike a more positive note about the recovery as soon as the hard data in Germany supports this view. In that respect, the key event risks are the August German industrial production (Oct 8th, RBS +4% m/m) and German (November 13th, RBS: +1% q/q). A reassessment of the German labour market situation by the Bundesbank is also in the offing. Indeed, Bundesbank Weber stated recently that he expected the unemployment rate to rise well into 2011.

Hawks to remain in the minority for some time

A more hawkish Bundesbank will not be sufficient to turn the tide and convince the whole council that the time to reign in some of the stimulus has come. Indeed, we believe that the Council will need more evidence that the recovery is indeed sustainable. This probably includes the publication of both Q3 and Q4 GDP which brings us to March as the earliest for the Council to feel comfortable to talk about sustainable recovery.

At that time though, a number of other considerations will likely prevent the Bank from becoming overly aggressive:

(i) the ECB inflation projection at the time will still likely be below its comfort zone for both 2010 and 2011. The wage dynamics around the euro area will be very subdued, with the IG Metall negotiations at the end of Q1 likely to come on the low side;

(ii) Monetary and credit developments will likely be in negative territory on a y/y basis by the end of Q1, a development which should keep the monetarist on the cautious side; and

(iii) the ECB will still be wary of past policy mistakes (notably those of 1936 in the US and 1996 in Japan) when policy accommodation was removed too early.

Japan

Junko Nishioka
Chief Japan Economist
junko.nishioka@rbs.com
+81 3 6266 3589

Short-term euphoria made by the government

Key economic fundamentals: short-term euphoria made by new government

Japan's Q2 GDP was unexpectedly revised down from +3.7% qoq annualised to +2.3%, due to a reduction in private inventory and corporate capex. However, this is not necessarily negative for the near-term economic outlook – the downgrade in corporate inventory signals a recovery in factory production at the early stages of an economic recovery. Significant downside risks to the economy remain, from domestic as well as external demand, but we expect continued positive growth on weakening of inventory liquidation and on government support. We revised our GDP forecast for 2009 down, from -5.5% to -5.8%, and for 2010 from +1.2% to +0.9% given the downward revision of GDP and the government's decision to suspend part of supplementary budget for FY09.

On the price front, July nationwide core CPI fell to -2.2% yoy vs -1.7% yoy in June primarily due to a base effect from last year, a widening negative output gap, estimated to be -7.8% in Q2 this year and the yen's appreciation against the US dollar. The negative output gap and the yen's appreciation are highly likely to weigh on underlying trend of core CPI even after the base effect disappears. Given the recent yen appreciation and the government's decision to abolish the gasoline tax from April 2010, we revised our core CPI forecast for 2010 down from -1.2% yoy to -1.4% yoy.

Policy outlook

A lot of attention is being garnered for the next action of the new administration, but it seems the Bank of Japan (BoJ) has enough time on its side to assess the impact of monetary policies that it implemented from late last year. In September's policy meeting, the BoJ slightly raised its economic assessment, but kept stressing the downside risks of the economy and the risk of deflation. In terms of credit easing policy, such as outright purchase of CP and limitless collateralised lending (so called 'monster operation'), the bank did not mention whether its discussed extending those measures again from the current year-end to the end of March next year or beyond. However, it is too early to judge the step as normalisation of accommodative policy. Given the still-tight funding conditions – especially in SMEs – and mounting deflationary pressure, the bank may extend those measures again by the end of this fiscal year. After the regime change in the government administration, we think the new government will eventually push the BoJ to buy more JGBs so that the administration can fulfil additional economic stimulus packages for the coming years funded by JGB issuance.

How the government and the BoJ will react to the yen's appreciation is another important issue. When the USD/JPY trades below 90 yen, we think the Japanese authorities likely will turn cautious in allowing further appreciation, which would cause a decline in corporate profit and deflationary pressure. At the moment, the DPJ-led new government appears unmotivated to intervene in the currency because it aims to promote a more consumer-driven economy. In fact, Minister of Finance Hirohisa Fujii said that 'the merit of the yen's appreciation is significant for a domestic demand-driven economy'….'we should not intervene in the market except in times of emergency.' But, we think its policy may change when expectations about a regime shift subside and yen-appreciation risks to the economy come to the fore.

Non-Japan Asia

Sanjay Mathur
Chief Emerging Asia Economist
sanjay. mathur@rbs.com
+65 6518 5165

Near-term growth momentum should remain strong

Underpinnings to near-term Asian growth have strengthened considerably and risks to forthcoming data are to the upside. The main indicators that support our view are:

1) inventory replenishment, particularly in the electronics sector;

2) high headroom for fiscal expansion; and

3) ongoing recovery in asset prices.

Recovering growth momentum and easy global liquidity conditions provide a favourable backdrop for sustaining asset price expansion in the region.

We briefly discuss these indicators. The potential scale of inventory replenishment is evident from the relative ratio of new orders to inventory subcomponents in the US manufacturing ISM. Equally, the semiconductor equipment book-to-bill ratio has moved up to above 1, consistent with rising demand for electronics exports. Electronics are Asia's dominant export product. Finally, we also note that ytd fiscal deficit levels fall short of projected targets mainly due to delays in public spending. Considering that fiscal stimulus programmes are intended to run through 2010, they could provide critical support in the event of a relapse in global demand.

Inflationary pressures in the region are still tame. Food prices are the only form of inflationary pressure at this stage. Broader inflationary pressures are absent, reflecting a combination of still large output gaps and currency appreciation. The more serious policy issue at this stage is asset price inflation and property prices in particular. Property prices have started to turn around almost across the region and are gradually becoming a policy issue. Our best guess is that policymakers will first opt for regulatory measures and subsequently withdraw liquidity. Conventional tightening in the form of higher policy rates is likely to be the last option.

The rebuilding of FX reserves has continued apace over the past month as global liquidity is finding its way into the region; external reserves have been rebuilt to 2008 peak levels in most countries. The laggards are Korea, India and Malaysia but even in these countries, reserve accumulation is progressing at a rapid pace. We believe that central banks in the region will continue to rebuild external reserves, but would also become increasingly tolerant of FX appreciation.

FX

Alan Ruskin
Head of Currency Strategy
alan.ruskin@rbs.com
+1 203 897 6402

The burden of proof

What's become apparent since the our forecast update is that bearish views on the US dollar have become entrenched. We previously asserted that "fiscal stimulus, pent-up demand, and inventory rebuilding should maintain growth momentum into year-end". These views have now become the market consensus. The idea that risk will turn US dollar-supportive by the end of 2009 looks a minimum of a quarter too early; meanwhile, the market can digest upside European growth surprises and negative year-end US dollar seasonals. One additional negative US dollar surprise has been a slight shift in rate spreads against the US dollar, despite the move away from QE.

We see year-end EUR/USD at 1.48; however, before year-end US infrastructure spending should kick in (less than 20% of allocated funds have been spent at the time of writing), and for a short time fiscal policies will become a relative US dollar boon and not a burden, as it temporarily adds to relative US growth. The US dollar will also play some role in reallocating growth and is another reason we're hanging on to a view of fading relative euro strength toward 1.50.

Although the G5 cycles have been synchronised and the fiscal boost may support some relative US growth acceleration, this is not shaping up into a traditional pattern of first into, first out of recession. On the contrary, this is more of a first in, last out (most of the G5); last in, first out (emerging Asia and commodity-based countries) cycle. In the G10 world, those who pushed to the limits of the zero bound and pursued various forms of unorthodox policy should be the last to tighten. In contrast, those with the smallest output gaps are inclined to see their central banks first out of the gate – Australia and Norway this year and the rest some time in H2:10 at the very earliest. This represents the most important point of differentiation in the G10 world. The Australian dollar already looks fully valued, but could extend to a little shy of 0.90 vs the US dollar.

But what is the best funding currency? The US dollar stands out for its liquidity and is the current favourite. The euro, however, is a better long-term choice, we believe, given it is overvalued against the US dollar, sterling and Scandinavian currencies, based on our short and long-term models. And if the euro is preferred why not use the Swiss franc as a funder, keeping the SNB on your side? A notable absentee among funders is the yen, which is caught in an array of inseparable factors, including incentivised dividend repatriation and DPJ policy uncertainties. Level heads should prevail in the new government, protecting USD/JPY's downside, well ahead of the 1yr straddle breakeven (currently 83.8).

Sterling should remain crucially short of carry over the next six months amid concerns about the sustainability of the upswing in UK surveys. This will dominate already stretched long-term valuations and sterling could remain unloved for the majority of the year. But, as the prospects for the US dollar haven't brightened as we'd expected, our year-end forecast stand at 1.66.

The biggest challenge to our view that the US dollar will underperform the rest of this year is from expectations for US interest rates. If the market starts pricing in earlier Federal Reserve interest rate hikes, this would be taken as a positive for the US dollar. Conversely, the biggest challenge to our view that the euro's value is already stretched would come with a deterioration in the US external accounts. However, we find it more likely the US export sector will continue to outperform its euro-area counterpart, providing the valuation-based real economy foundation, for a turn in EUR/USD.

Economics – China special

Ben Simpfendorfer
Chief China Economist
ben.simpfendorfer@rbs.com
+852 2966 2531

The euphoria will fade

The speed of China's recovery has so far impressed. Fiscal stimulus laid the foundations for a rapid strengthening in activity, and GDP growth accelerated in 2Q to reach 7.8%.

The euphoria over a V-shaped recovery should grow in 2H 09. Year-ago changes in the monthly economic data should rise sharply regardless of the underlying trend – economic activity collapsed this time last year, providing a low base of comparison against which to measure this year's activity. Industrial production, for instance, is forecast to reach near 20% yoy in the final months of the year. Electricity production may rise at even more notable rates.

The rapid narrowing of deflation should also appear to confirm the strengthening of economic activity. Food prices have started rising on a month-ago basis. The rate of decline in rental prices is also slowing following stabilisation in the housing market. Certainly manufacturing overcapacity could exert downward pressure on core-consumer goods prices. But food prices are the largest and most volatile driver of the CPI. Inflation may return as early as 4Q.

There is already discussion among academics about the need to tighten monetary policy. The PBOC and banking regulators have used a combination of verbal warnings and regulatory changes to slow credit growth from its surging 1H pace. The State Council ultimately decides monetary policy, and it has yet to signal a change in the policy stance. But the market is likely to shortly start pricing in a rising 1-year lending rate, the policy rate.

However, I maintain my bearish view on the outlook. Restocking played an important role in the 1H recovery. The composition of growth also remains imbalanced and overly reliant on public and residential investment. I thus **forecast 2010 GDP at 8%, unchanged from this year's forecast**. I expect my more bearish view will gain traction in 1H10 as the monthly data starts to record slower year-ago growth rates on unfavourable base effects and the scope of the structural challenges becomes more evident.

The lack of economic reform is central to this view. In the late 1990s, the government faced similarly large challenges as GDP growth slowed to below 7%. Fiscal stimulus was the initial response to the crisis. But it was later followed by a series of "big-bang" reforms, including liberalisation of the housing sector, state-owned enterprise reform and entry to the World Trade Organization. It was the later series of economic reforms, not fiscal stimulus, that produced the impressive growth rates of the past decade.

The government has not introduced a single "big-bang" reform in the currency period. And there is a chance that it has failed to appreciate the risks of a long retrenchment in global consumption. If so, the economy remains dangerously reliant on public and residential investment.

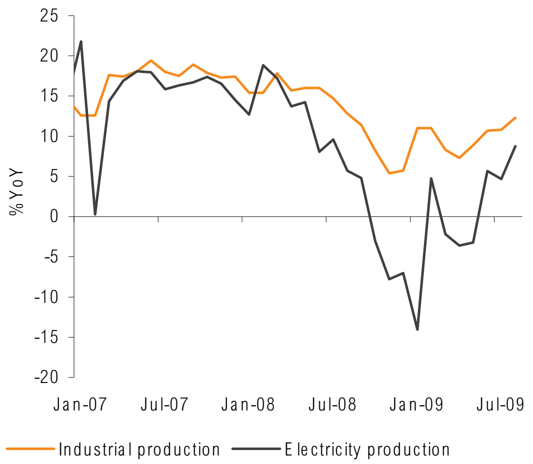
I expect private business investment will remain weak in 2010, plagued by overcapacity and a dearth of new investment opportunities. The lack of quarterly expenditure-based GDP makes it difficult to observe such spending. However, the National Development and Reform Commission, the country's state planner, recently proposed measures to spur private business investment, while the US dollar value of exports is still 25% below its peaks, implying significant overcapacity in the light manufacturing sector.

The government is talking of resolving demand-side obstacles, such as spurring private consumption. However, reform is slow, and this is a decade(s)-long project that will owe as much to generational change as improving social welfare and reducing health and education costs. More attention must be paid to supply side obstacles, in particular liberalising the services sector, such as the logistics sector. To date, the services sector remains fragmented or subject to government monopolies.

A failure to reform raises the risks to medium-term growth prospects. However, the implications for commodities demand are less bearish than they are for the overall economy. I expect that the government will respond to any downside growth surprises by spurring spending on public infrastructure and residential property. Spending in these two sectors is largely responsible for the rapid acceleration in the nominal monthly fixed investment data to above 30% yoy in 1H.

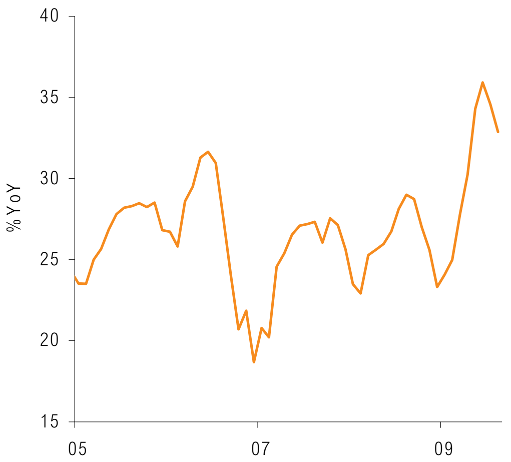
It is popular to talk about “bridges to nowhere”. But China’s GDP per capita, on a PPP-basis, is ranked 99 in the world, and the rural areas still lack basic water and electricity services and a target for new spending. (Indeed, the latter is an obstacle to subsidies aimed at spurring rural consumption of household electrical goods). There will be instances of waste and overcapacity, but we believe the government has the capacity to sustain public investment spending for a number of years even if this fails to resolve economic imbalances.

Base effects will spur yoy growth of industrial and electricity production in 2H



Source: CEIC; RBS

Urban fixed investment growth is strong on public and residential investment

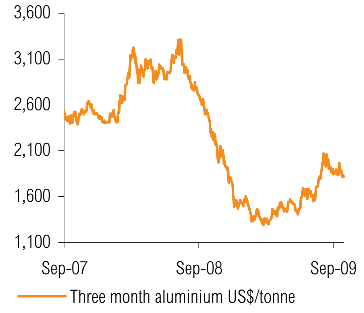


Source: CEIC; RBS

Aluminium

Economically geared metal faces huge challenges

Aluminium – hopes springs eternal as price rises 60% from its low



Source: LME

If you like investing in underdogs, then aluminium is for you! The light metal will need all the escapology skills of Houdini to prevail against the formidable challenges ahead. Aluminium has been our least preferred industrial metal and indeed thus far its price, rising only 26% since end-2008, has been the worst performing of the base metal suite. Aluminium's broad spread of consumer end uses means that it is particularly economically geared. The traumatised transport and construction sectors, for example, account for about 50% of total world aluminium consumption. Aluminium demand, down 7.5% in 2009, will be the worst of the industrial metals. The flip side is that we expect demand growth to comfortably outstrip the other metals (bar nickel) in 2010-12.

There is no cloak and dagger mystery about aluminium's issues. Exchange inventories are at record highs of nearly 5mt, with total reported inventory forecast to end-2009 at record levels of 6.50mt equivalent to nearly 10 weeks of consumption. Alas, Chinese aluminium producers have been busy reactivating supply, with China's annualised output up a substantial 31% in just five months, with over 3mtpa of restarts and new capacity coming onstream.

However, we forecast world GDP rising by at least 3.6% yoy in 2010, translating, with a consumer restocking episode, into two consecutive years of inventory eroding 10% pa aluminium demand growth. Note, too, that producer inventories are at record lows. The key remains for western producers not to follow China in prematurely reactivating capacity, especially with so much reliance upon the business cycle recovery. We are near term neutral, post-2011 bullish.

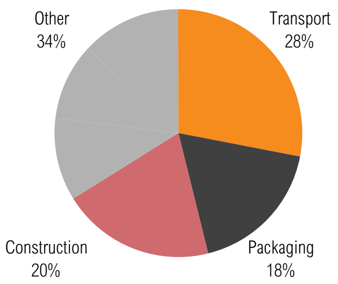
RBS world aluminium supply/demand outlook to 2013F; 5 years of surplus to erode – demand needs to be robust

(m tonnes)	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**	**2013F**
World primary aluminium production	**33.90**	**38.12**	**40.15**	**37.50**	**39.00**	**42.25**	**45.00**	**48.00**
Change (%)	**5.9%**	**12.4%**	**5.3%**	**-6.6%**	**4.0%**	**8.3%**	**6.5%**	**6.7%**
Total Asia (includes China & Middle East)	13.08	16.57	17.92	17.75	20.00	23.00	25.75	29.50
Change %	17%	27%	8%	-1%	13%	15%	12%	15%
of which China	9.32	12.57	13.70	12.75	14.50	16.00	18.00	20.50
Change %	*19%*	*35%*	*9%*	*-7%*	*14%*	*10%*	*13%*	*14%*
Europe (Including Russia)	8.87	9.22	9.76	8.00	7.50	7.45	7.75	8.25
Change %	-1%	4%	6%	-18%	-6%	-1%	4%	6%
of which North America	5.33	5.64	5.78	4.75	4.90	5.25	5.45	5.60
World refined aluminium consumption	**34.52**	**37.97**	**37.50**	**34.65**	**38.15**	**41.95**	**45.25**	**48.50**
Change (%)	**8.0%**	**10.0%**	**-1.2%**	**-7.5%**	**10.0%**	**10.0%**	**8.0%**	**7.0%**
of which Asia	16.30	19.80	20.28	19.80	22.25	24.80	27.00	29.50
Change %	13%	21%	2%	-2%	12%	11%	9%	9%
of which China	8.75	12.07	12.60	13.25	14.75	16.50	18.25	20.00
Change (%)	22%	38%	4%	5%	11%	12%	11%	10%
of which North America	7.20	6.50	6.10	5.15	5.60	6.15	6.50	7.00
Change %	n/c	-10%	-6%	-16%	9%	10%	6%	8%
of which Europe	8.90	9.40	8.80	7.20	7.50	8.00	8.50	9.00
Change %	5%	5%	-6%	-18%	4%	7%	6%	6%
Implied market balance	**-0.62**	**0.15**	**2.65**	**2.85**	**0.85**	**0.30**	**-0.25**	**-0.50**
Actual reported stock	2.67	2.80	4.53	6.50	7.00	6.85	6.50	6.00
Stock: consumption ratio (weeks)	**4.0**	**3.8**	**6.3**	**9.7**	**9.5**	**8.5**	**7.5**	**6.5**
LME spot aluminium price (US$/tonne)	**2,565**	**2,640**	**2,570**	**1,645**	**2,000**	**2,200**	**2,525**	**2,875**
LME spot aluminium price (US¢/lb)	**116**	**120**	**117**	**75**	**90**	**100**	**115**	**130**
Change % yoy	**35%**	**3%**	**-3%**	**-36%**	**22%**	**10%**	**15%**	**14%**

Source: CRU, IAI, WBMS, LME and RBS forecasts

Demand – looks set for robust rebound in 2010-11F

Aluminium consumption by key sector offtake



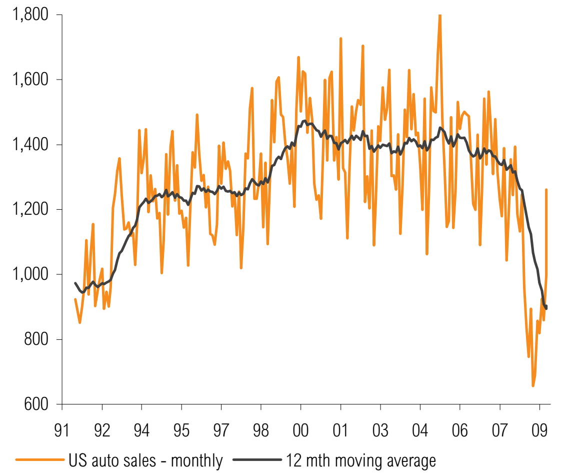
Source: CRU

World aluminium consumption has just endured two consecutive years of contraction, during which time offtake has fallen by 9%, equivalent to 3.32mt of metal lost to the recession. Aluminium is used in a broad range of end-use sectors embracing transport, construction, packaging, electrical and consumer durables, hence aluminium consumption is economically geared and the dismal macroeconomic environment has taken a heavy toll upon aluminium consumption. But so too the reverse. Historically, aluminium (along with nickel) has been a metal showing potent demand growth in upswings of the world economy. This potency will derive from real consumption growth augmented by consumer and distributor restocking. Our long-run trend growth forecast for world aluminium demand is 4% pa, but for the above reasons, we forecast that the next two years will enjoy well above trend 10% pa increases.

'Cash-for-clunkers' schemes – mission accomplished

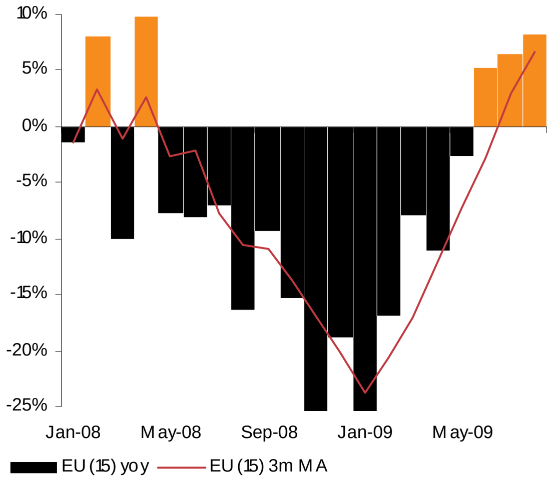
Aluminium's use in vehicles arises from properties such as its weight-saving advantages over steel. Aluminium has a range of applications such as engine blocks, alloy wheels and vehicle space frames. One of the key areas for renewed aluminium demand growth should arise from the very successful governmental cash-for-clunkers subsidy schemes. These have reversed the substantial production cuts made by many of the world's key automobile manufacturers. For example, so successful was the US clunkers scheme that barely a month after it was introduced, the scheme was closed for fear of breaching the US$3bn ceiling allocated by Congress. Industry estimates suggest that nearly 700,000 new sales were generated by the US scheme. The chart below shows the astonishing rebound in US auto sales, which in August at 1.261m units was the strongest in 15 months and up over 90% from the January 2009 nadir.

Total US auto sales hit 17-year lows in Jan'09, but rose to 15-month highs (units of vehicle sales)



Source: Bloomberg and RBS

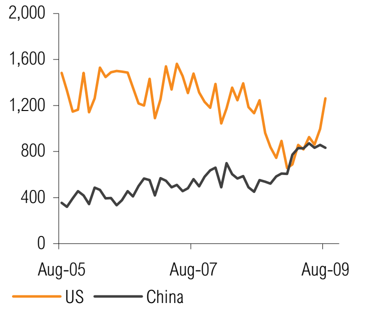
Percentage change in monthly EU passenger car registrations (% ch yoy)



Source: ACEA and RBS

This most pragmatic of consumer stimulus schemes began in Europe, led by Germany. The right-hand chart above shows data from the European Automobile Manufacturers' Association (ACEA) for the European Union. Contraction in EU passenger car sales has come to an emergency halt and they have now rebounded to post three consecutive months of net increase with registrations at 16-month highs. Yes, we are concerned that the scrappage schemes have merely brought forward future sales and 2010 may see a relapse when the schemes expire. However, we note that such has been the success of the schemes that some EU countries are showing signs of supporting the schemes

Chinese auto sales vs US light vehicle sales; catching up (000)



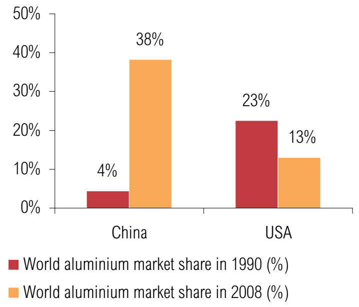
Source: RBS, Motor Associations

into 2010 with Germany allowing delayed deliveries under its scheme into 2010. Whatever the ethics of scrapping perfectly functional vehicles, the net effect will be to reduce the average age of the vehicle fleet; replacing vehicles with poor emission levels with more fuel-efficient, lower emission vehicles and with better safety features. One other feature is that many of the new vehicles being purchased are smaller than those scrapped.

In Germany, the €5bn scheme (now ended) that began in February offered €2,500 for vehicles more than 9 years old. Over 600,000 new car registrations and 1m applications have been received. Other EU countries, such as France, Italy, Spain and the UK, have adopted similar schemes. The UK scheme, which began in May and was set to last until February 2010, provides a £2,000 incentive split equally between the government and the motor manufacturer. This scheme has just been extended to embrace a further 100,000 vehicles having been close to reaching its funding limit. Scrappage has also been a roaring success in China which introduced its own incentives and the China Association of Automobile Manufacturers reported that passenger auto sales were up 90% yoy in August, with a total of 858,300 passenger cars sold vs 451,400 in August 2008. As our sidebar chart shows, at one stage Chinese vehicle sales overtook those of the US, prior to the US scrappage scheme stimulus.

Watch for rebound in demand from dismal lows as business cycle recovers

China's share of world aluminium demand has risen from 4% to 38%

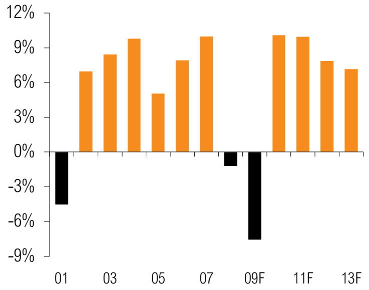


Source: WBMS and RBS

World aluminium consumption in 2008-09 underwent a significant growth dislocation, not unlike that seen after the two oil shocks of the mid-1970s and early 1980s. Between 2001 and 2007, world aluminium demand increased at a CAGR 8% pa, double the 4% pa growth rate of the second half of the 1990s. The key reason for this above-trend growth was the boost that aluminium demand received from rapidly growing Chinese consumption, which averaged a CAGR of 23% pa over 2001-07. But 2007 proved to be a watershed for aluminium demand. Growth of 10% yoy took world demand to a record 37.97mt, with China slotting in a headline-grabbing 38%. The 2008 year saw world demand contract 1.2% and we forecast an additional contraction of nearly 8% in 2009, to 34.65mt.

We view 2010 as a year in which most of the key consuming regions will claw their way out of the abyss. Evidence is already gathering. US housing starts and auto production on the rise; we see exciting data from China on auto sales but also on rising floor space under construction, all part of the Chinese urbanisation and industrialisation theme. The key point here is the shift in the rural population towards the cities. In 1990, around 28% of the population lived in cities against a current level of around 45%. This has meant rising incomes and aluminium consumption per capita in China remains on a rising curve. We note that China has been a significant importer of aluminium and products in 2009 via its state-sponsored stockpiling initiative at both the provincial and state level – eg Henan Province buying 0.500mt of metal and SRB stockpiling 0.590mt.

Yoy change in world aluminium consumption 2001-2013F

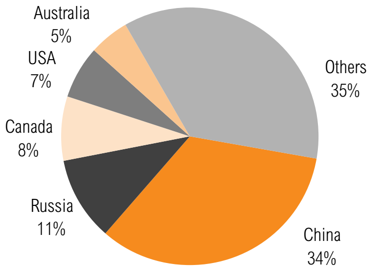


Source: CRU and RBS

Our economists forecast that world GDP will soon be on a sharply rising trajectory and increase by 3.6% in 2010. We expect this to have dramatic implications for world aluminium offtake, which we forecast will increase by more than double that growth rate to 10% in 2010 and in 2011. Typically, as consumer confidence returns, low-ticket item purchases such as white goods (dishwashers, washing machines, freezers etc.) recover first. Off a low 2009 base of 34.65mt, we forecast that world aluminium demand, augmented by consumer restocking, will rise by 3.50mt in 2010 to 38.15mt and a further 3.80mt in 2011. Growth will likely moderate thereafter, but between end-2009 and 2013, we forecast world aluminium demand will rise by 13.85mt a CAGR of 8.8% pa.

Supply – China presses reactivation button

Key producer % share of '08 world aluminium output – China 34%



Source: IAI and WBMS

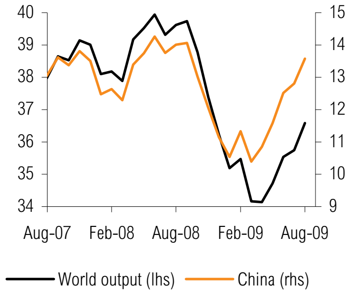
The world's aluminium producers are emerging from one of the worst operating environments in living memory. Prices that peaked at a record high in July 2008 of US$3,320/tonne (US$1.50/lb) inspired an attitude among producers of "we've never had it so good". By mid-February 2009, spot metal troughed down over 60% at US$1,288/tonne (US$0.58/lb), the lowest price since November 2001 in nominal terms and in real terms the lowest ever. The industry was haemorrhaging cash and we estimate that more than 50% of the world's aluminium producers were losing money on a cash cost basis and about 75% on a full cost basis. Hence the massive cutbacks that at their peak totalled c7mt, or 18% of world supply.

Low prices and slumping demand induced production cutbacks that have conspired in 2009 to drive down world primary aluminium output by an estimated 6.6% to 37.50mt – reduction of 2.65mt yoy. But it is very much a mixed picture; one camp has a strategy of optimising output, the other of maximising production.

On one hand, European and North American aluminium output is on course to contract by 18% apiece (not helped by the 0.250mt loss at UC Rusal as a result of the Sayano-Shushenskaya hydro-electric dam disaster). On the other hand, China has already embarked upon rapid capacity reactivation and commissioning of new smelters.

Chinese reactivations lift output rate to 15-month high

Rebound in Chinese output drives up world aluminium output (mt)



Source: RBS

The International Aluminium Institute (IAI) has reported that its members, including China, produced 23.43mt of metal in January-August, 10% or 2.62mt less than the comparable 2008 period. The issue, though, is that world output has already embarked upon an upward trajectory and this is before we have any clarity that real demand growth is here to stay.

Aluminium is essentially a manufacturing process and the Chinese absolutely dominate the world aluminium industry, with more smelters in China than in the rest of the world combined. However, Chinese production, which had been growing relentlessly for a number of years, in 4Q08 went into reverse and four consecutive mom output declines slashed 25% off output.

As our next table shows, yoy Chinese production growth accelerated from 20% in 2006, to a record 35% in 2007 and courtesy of the cutbacks, a meagre 4% in 2008. Data from the International Aluminium Institute (IAI) for August shows that in January-August, China produced 7.793mt, down 1.113mt yoy a 12.5% yoy decline.

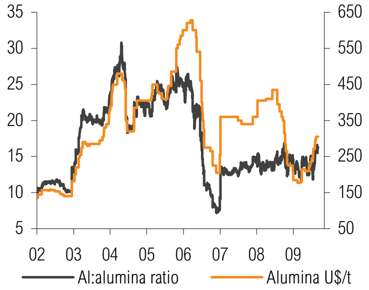
Key, though, is that since the March 2009 production low, China has pushed the button for reactivation and every one of the past five months has seen mom output rises. Output rose by 6% mom in August and has risen by 31% since the March 2009 low, representing an annualised 3.2mtpa of new and reactivated production. We estimate that China could have a further 2mtpa to bring on-stream over the next 12-18 months.

Chinese cutbacks in 2008 reduced output growth to just 4% yoy. Alas, cutbacks are already being reversed and strong rebound under way

mt	2002	2003	2004	2005	2006	2007	2008	8M '08	8M '09
Primary production	4.321	5.547	6.689	7.806	9.349	12.588	13.105	8.906	7.793
Change	0.950	1.226	1.142	1.117	1.543	3.239	0.517		-1.113
Change yoy	28%	28%	21%	17%	20%	35%	4%		-12.5%

Source: International Aluminium Institute

Aluminium restarts have boosted the alumina price and ratio (lhs %)



Source: Bloomberg and RBS

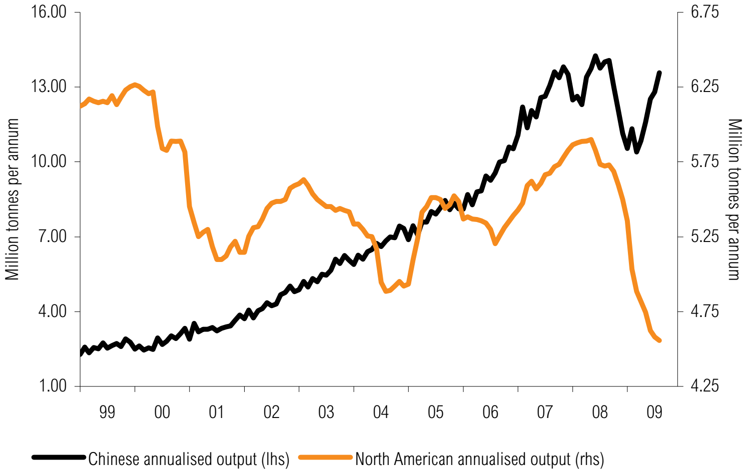
Alumina is the feedstock for producing aluminium. Chinese aluminium smelter restarts of over 3mtpa have boosted alumina demand. Domestic refinery output has not kept pace with the restarts and alumina imports have risen sharply. Customs data shows that ytd Chinese alumina imports are up 14% yoy, with April imports the highest in over two years. Accordingly, the alumina price has risen sharply this year. From an April '09 low of US$178/tonne, the spot alumina price has risen over 70% in just five months to US$305/tonne.

The chart below shows IAI data for the annualised operating rate for the world's two key aluminium-producing regions, China and North America. It shows the opposed approaches to this consumption crisis, with western aluminium producers needing to make room for the Chinese reactivation.

Longer term, though, aluminium production is all about energy, and the higher marginal cost of Chinese energy still makes it likely that its smelting industry will remain at the upper end or wrong end of the cost curve. What also cannot be ruled out is an appreciation of the renminbi as the US dollar comes under more intense selling pressure.

We forecast that Chinese aluminium output will now contract 7% in 2009 to 12.75mt, rebound by 14% yoy in 2011 and maintain double-digit output growth through to 2013F.

Chinese and North American aluminium output accounts for 50% of world output. Alas China has begun capacity reactivation in earnest



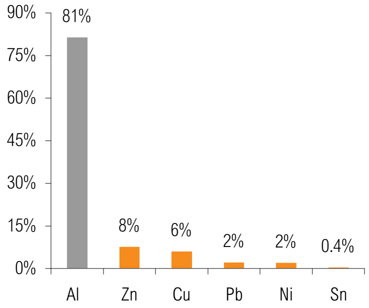
Source: IAI and RBS

Outlook – all hinges on the economic macro

We think that aluminium has now comfortably passed the point of maximum despair in terms of both price and market fundamentals. With the price well off its lows and producer reactivations already under way, the focus is now the expected upturn in the world business cycle. The list of governments now declaring their economies to be out of technical recession keeps on rising. So what are the positives for aluminium that may offset the headwinds?

Metal is tied up in long term warehousing deals – As can be seen from our sidebar chart, aluminium inventories comprise a substantial 81% of total LME warehouse stocks of metal. But what is seen cannot necessarily be obtained. In our note published 25 August, *Aluminium inventories – not all they seem*, we warned that a large proportion (60-70%) of LME aluminium inventory was tied up in long term (3- to 15-month) financing and warehouse deals.

Aluminium dominates total LME warehouse inventory holdings



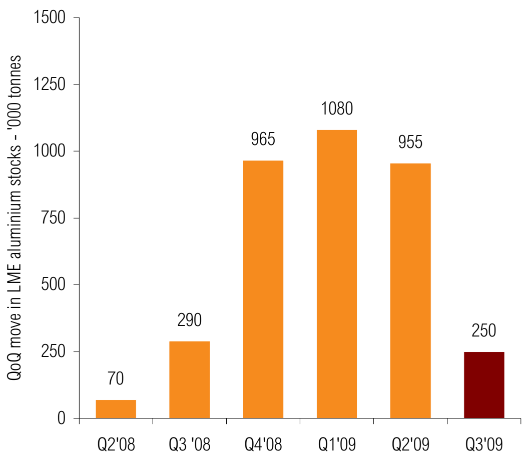
Source: LME

Japanese port and IAI stocks at record lows – Japanese port stocks of aluminium, now at 0.192mt, are around the lowest level on record. Further IAI producer inventory ended July at 1.205mt, down a massive 0.471mt from end-2008 and also the lowest level of stocks since IAI records began in 1973.

Aluminium ETF and Rusal Glencore wild cards – Another supportive factor could be the lock-up deal reported in trade journals that Russian aluminium producer US Rusal has made with Swiss trading house Glencore. In June, Glencore agreed to buy 0.800mt of aluminium from the indebted UC Rusal, which was in September augmented by an additional 0.500mt, bringing the total to 1.30mt of metal, around 3.5% of world production and helping driving up price premiums in Asia as Rusal withdrew deliveries from the market. In a neat twist, late September saw the news that Glencore was in discussions with a finance house to create the world's first physically backed Exchange Traded Fund (ETF) in aluminium.

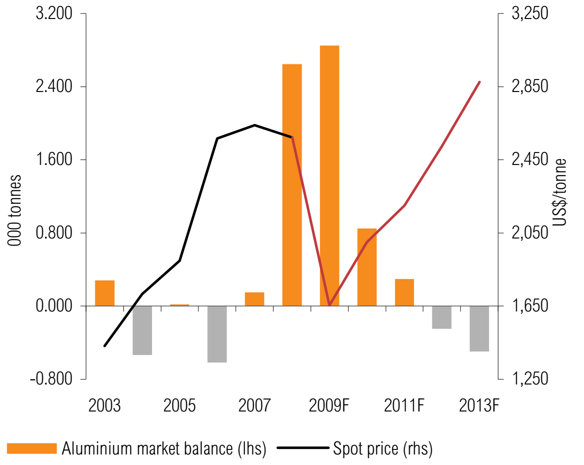
Pace of inventory build has slowed markedly – In the left-hand chart below, we show the rate of change in LME and SHFE aluminium inventory build over the past 18 months. This has slowed sharply in Q3 09. As the recession deepened and demand slumped, inventory accretion rose very sharply from 0.290mt in Q3 08 to 0.965mt in Q4 08 and a record 1.080mt in Q1 09. Net inventory build over Q3 09 has been just 0.250mt. Indeed, something worth noting is that LME registered warehouse stocks of aluminium have until now risen for a notable 18 consecutive months. But September is on course to break this period of inexorable accretion, with stocks down 30,000 tonnes mom.

Quarter-on-quarter moves in LME & SHFE aluminium inventory. Ingresses sharply lower in Q3 09



Source: LME, SHFE and RBS

World aluminium supply/demand surplus and deficits, 2003-13F. Supply surplus should drop and price rise



Source: CRU, LME and RBS forecasts

As the right-hand chart above shows, we forecast that the world aluminium market will remain in surplus for two more years, bringing the total to five consecutive years of net supply build. This will bring the cumulative supply surplus between 2007 and 2011 to 6.80mt.

Crucially, we expect demand growth to rapidly diminish the scale of supply surpluses post 2009. It is likely that the financial community will be encouraged by the rollover in reported inventory, boosting the price. Certainly post 2011 as supply shortfalls re-emerge, pricing tension is forecast to return with alacrity.

In the charts below we have shown Exchange stocks of aluminium in absolute terms but also total reported stocks (Exchange plus producer, port etc) expressed in terms of a stock:consumption ratio. We forecast total reported inventories at end-2009 will reach 6.50mt, equivalent to 19% of 2009 world consumption. By 2013F, we think that inventory will have been eroded to around 12% of world demand. Typically, as the right-hand chart below shows, less than five weeks of stock has been a trigger for markedly higher aluminium prices. We estimate that by end-2009, the aluminium market will be double this level at 10 weeks the highest stock ratio in 15 years. This equates to 6.50mt, thus over 3mt needs to be eroded.

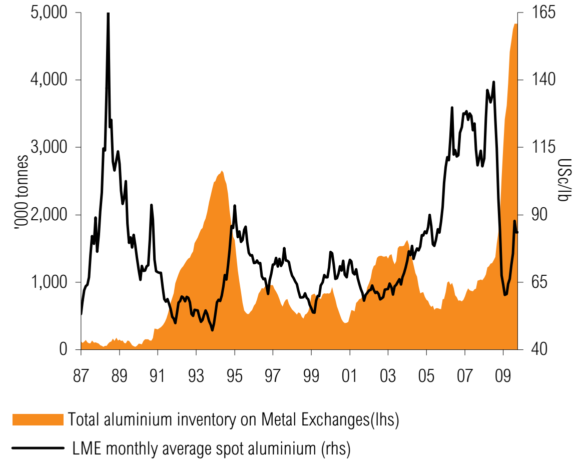
Next few months will be crucial to getting the recovery under way

We have left unchanged our long-term aluminium price at US$2,425/tonne (US$1.10/lb). Rising cost pressures from a weaker US dollar have been offset by lower energy and raw material inputs, whilst the inventory overhang and idled capacity will likely defer plans for too many new smelters to come to the drawing board for a while.

We have raised our aluminium price profile only slightly since our April *Commodity Companion,* by 5-7% for the 2009-11F years. Thereafter we have retained our enthusiasm for the price profile. Having averaged 2008 at US$2,570/tonne (US$1.17/lb), our forecast for a 2009 spot price average of US$1,655/tonne (US$0.75/lb) will represent a 36% yoy price decline. We expect modest price progression in 2010-11 as the supply surplus is reduced.

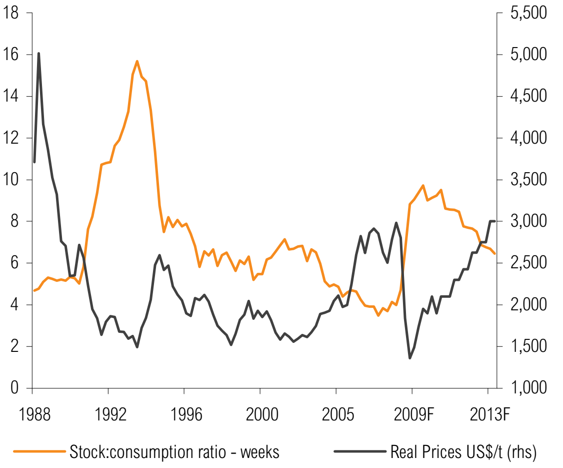
The real fireworks should begin in 2012, when we expect the first supply deficit in 5 years to emerge. By 2013, we expect a 0.500mt supply shortfall, leading us to pencil in an aluminium price average more than 70% higher than in 2009 at US$2,875/tonne (US$1.30/lb). The aluminium market is on the mend and has already been able to contend with the reactivation of around 50% of its idled capacity. Our outlook stance is near-term neutral, post 2011 bullish.

Total Exchange stocks of aluminium at record highs. But watch them come down when demand accelerates



Source: LME, SHFE and RBS

Aluminium stock:consumption ratio vs real price. We forecast stock ratio will start declining post 2009



Source: IAI, WBMS, LME, SHFE and RBS

Selected price-related production cutbacks in the aluminium industry since mid-2008 – (red indicates reactivation)

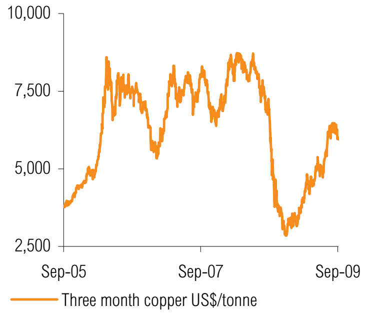
Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Alumina refineries			
Shandong, Weiqiao, China	Implemented September 2008	Cut 2mt/y of 4mt/y capacity	
Shandong, Lubei, China	Announced October 2008	To close 1mt/y refinery	
Point Comfort, Alcoa, US	Implemented November 2008	Cut by 550kt/y	
Zaporozhye, Rusal, Ukraine	Announced November 2008/March 2009	Unspecified cut at 265kt/y plant	
Chalco, China	Announced November 2008/March 2009	Closing ~4.3mt/y of cap. (39% of total)	Restarting 670kt/y by August 2009
Alcoa	Implemented November 2008	Unspecified cuts of ~700kt/y	Believed to be in addition to Pt. Comfort
Podgorica, KAP, Montenegro	Announced November 2008	Unspecified cut at 280kt/y plant	
Eurallumina, RUSAL/Glencore, Italy	Announced December 2008/February 2009	Cut by 50%, then to close 1.1mt/y plant	
Ewarton/Kirkvine, Windalco (RUSAL), Jamaica	Announced December 2008/February 2009	To cut by 35% of combined cap., then close	Combined capacity 1.3mt/y
Henan Wanji, China	Announced January/April 2009	Cut to 50% at 800kt/y plant, then up to 80%	
Alcoa	Announced January 2009	Unspecified cut of a further ~250kt/y	
Nain, Alpart, Jamaica	Announced January/March 2009	To cut by 50%, then close 1.65mt/y plant	
Vaudreuil, Rio Tinto Alcan, Canada	Announced January 2009	To cut by 25%, or 400kt/y	Back to full capacity September 2009
Gardanne, Rio Tinto Alcan, France	Announced January 2009	To cut by 15%, or ~105kt/y	
Aughinish, RUSAL/Glencore, Ireland	Announced February 2009	To cut by 37% at 2mt/y plant	
Gramercy, Noranda Al, US	Announced Q1 09	Cut by 50% at 1.2mt/y plant	Back to full production Q4 09
Birac, Bosnia	Announced April 2009	Cutting by ~180kt to 120kt	Cap. 600kt/y but recent output ~300kt/y
Corpus Christi, Sherwin Alumina, US	Implemented April 2009	Cut 40% of 1.4mt/y metallurgical capacity	
Paranam, Suralco (Alcoa), Surinam	Announced May 2009	To cut by ~40% at 2.2mt/y plant	
Friguia, RUSAL, Guinea	Announced June 2009	To cut by ~385kt/y at 850kt/y plant	For one month, back to normal Aug 09
Aluminium smelters			
Columbia Falls, Glencore, US	Implemented July 2008/January 2009	Closed $1^{1}/_{2}$ of 2 potlines at 168kt/y plant	Other three potlines already closed
Sichuan Aostar, China	Implemented September/December 2008	Cut by 40kt/y, then total of 250kt/y	But began full restart in March 2009
Puerto Ordaz, Alcasa, Venezuela	Implemented September 2008/February 2009	Cumulatively cut to 75% of 210kt/y capacity	But has rarely produced at capacity
Rockdale, Alcoa, US	Implemented June, October 2008	Cut by 120kt/y, closure of rest (145kt/y)	
Vimetco, China	Implemented October 2008/January 2009	Cut in stages by 145kt/y	
Emeishan Aluminium, China	Implemented October 2008	Has cut by 50kt/y of 150kt/y	
Zhongfu, China		Has cut 50kt/y of 300kt/y plant	
Longquan Aluminium, China		Has cut 40kt/y of 600 kt/y	
HMHJ Aluminium, China		Has cut ~30kt/y of 300kt/y	
Shandong, Chalco, China		To close 70kt/y plant	
Zhengzhou, Chalco, China		To cut 40kt/y of 60kt/y plant	
Yunnan Aluminium, China		To cut by 10-15% of 400kt/y capacity	
Rio Tinto Alcan, Norway/UK	Announced October/December 2008	Cuts across various smelters of ~150kt/y	60kt UK, 90kt Norway
Dunkirk/St Jean, Rio Tinto Alcan, France	Announced November 2008	Cut of 29kt/y Dunkirk, 23kt/y St Jean	Dunkirk cut to be reversed by June 2009
Chalco, China	Announced October 2008/March 2009	Cut by ~950kt/y across company	Restarting almost all by Q4 09
Sepetiba Bay, Valesul (Vale), Brazil	Announced October 2008	To cut by ~57kt/y of 95kt/y	
Zaporozhye, RUSAL, Ukraine	Announced November 2008/March 2009	Closing 3 of 4 potlines at 115kt/y plant	
Alcoa, incl. Ferndale, US, Baie Comeau, Canada	Implemented November 2008	Cuts amounting to 350kt/y	
Ningxia Qinyi Zhongning, Rio Tinto Alcan, China	Implemented November 2008	Unspecified cuts at 150kt/y smelter	
Karmoy, Hydro Aluminium, Norway	Implemented/announced December 2008	To cut by 24kt/y at 120kt/y line	Then to close in Q1 09 instead of end 09
Aluminij Mostar, Bosnia	Announced November/December 2008	To cut by 25% at 140kt/y plant	Started to return to full cap. Sept 09
Podgorica, KAP, Montenegro	Announced November 2008	To cut by 60-65kt/y of 125kt/y	
Mettur, Malco (Vedanta), India	Implemented November/December 2008	Cut 40kt/y plant by 60%, then close	
Konin, Impexmetal, Poland	Announced November 2008	To close 55kt/y plant in H1 09	
Essen, Trimet, Germany	Implemented November 2008/January 2009	Closed 1 then 2 of 3 lines at 170kt/y plant	But partial restart May 2009
Portland, Alcoa, Australia	Implemented December 2008/April 2009	Cut by 15kt/y then to 53kt/y at 358kt/y plant	
Danjiangkou, China	Implemented December 2008/February 2009	Cut by 30kt/y at 120kt/y plant	
Husnes, Soral (Hydro/Rio Tinto Alcan), Norway	Announced December 2008/February 2009	Cutting in two stages to 50% of capacity	Capacity 173kt/y
Bogoslovsk/Uralsky, RUSAL, Russia	Announced December 2008	To cut by 180kt/y	Combined cap. 325kt/y, cuts mainly here
Tursunzade, Talco, Tajikistan	Announced December 2008/April 2009	Cut by ~25%, ~100kt/y at least in Q1 09	Started raising output July, full end 09
Ravenswood, Century Aluminium, US	Implemented December 2008/February 2009	Cut by 42kt/y, the closed 170kt/y plant	
Slatina, Vimetco, Romania	Implemented January/February 2009	Cut in two stages by 65kt/y of 270kt/y	
Alcoa Tennessee, Alcoa, US	Announced January 2009	To close 220kt/y plant	~85kt/y had already been cut
Shanxi Guanlu, China	Announced January 2009	To cut 40kt/y at 110kt/y plant	
Holyhead, Rio Tinto Alcan/Kaiser, UK	Announced January/August 2009	To close 145kt/y plant in Sept. 2009	
Beauharnois, Rio Tinto Alcan, Canada	Announced January 2009	To close 52kt/y plant in Q2 09	
Korba, Balco (Vedanta), India	Implemented January 2009	Cut of ~20% at 110kt/y line	
Neuss (Norf), Norsk Hydro, Germany	Announced January/April 2009	Gradual cut to 21% of 230 kt/y capacity	State aid plan to reverse H2 09 closure
RUSAL, Russia	Announced February 2009	To cut by further 320k/y	At unspecified plants in Russia
Hamburg, Trimet, Germany	Implemented February 2009	Cut of 30% at 130kt/y plant	
Hawesville, Century Aluminium, US	Implemented March/May 2009	Cut one 52kt/y potline, then ~14kt/y at others	Five potlines, combined capacity 250kt/y
Guangxi Yinhai, China	Implemented March 2009	Cut by ~33% of 250kt/y capacity	Back to full production by October 2009
Sunndal, Hydro Aluminium, Norway	Announced March 2009	To cut by 25% at 400kt/y plant	
Massena East, Alcoa, US	Announced March 2009	To cut by 120kt/y	
Novokuznetsk, RUSAL, Russia	Implemented April 2009	Cutting by 33% at 320kt/y plant	
San Ciprian/Aviles/La Coruna, Alcoa, Spain	Announced May 2009	Cut by 18% of combined capacity 408kt/y	Implemented in Q1 09
Hannibal, Ormet, US	Implemented May/August 2009	Closed 1 then 2 of 6 lines at 270kt/y plant	Alumina dispute with Glencore
Estimated unidentified cuts, mainly in China		~1,750kt/y	But 3mt/y + restarts in China by mid-2009

Source: Company reports, Reuters, Bloomberg, RBS

Copper

Remains our most favoured base metal

Copper price up 130% at best, recouping 60% of previous losses



Source: LME

Copper remains our most favoured base metal. It may not see the greatest price gains from current levels, but this merely reflects the excellent recovery this year. We do not consider copper's demand prospects among the best, but we believe copper producers will have the most difficulty keeping up with growing demand. We forecast that the copper market will be back in underlying deficit by 2011 and that by 2013, it will be fast approaching pre-recession tightness, with price-driven substitution and demand destruction perhaps becoming necessary. The market seems to now share our medium-term view.

We expect copper, uniquely among the base metals, to reach a new record high this cycle, perhaps as soon as 2012, and forecast an average LME cash price in 2013 of US$9,000/t. Before then, copper still has some work to do before the stars are fully aligned. Hefty surplus in 2008-09 has been disguised by massive Chinese stockpiling and we expect some of this material to find its way out into the market, easing the path back to underlying deficit. Investors may continue to see through this, but we expect price progress in 2010 and into 2011 to be much more modest than its excellent performance in 2009 to date.

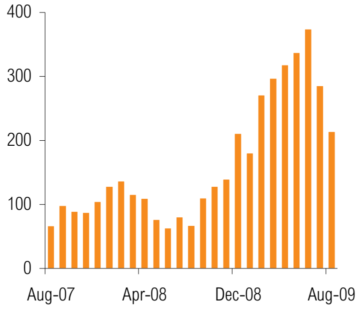
RBS world copper supply/demand balance, 2006-13F – hefty 0.75mt surplus in 2009, but supply deficits by 2011

(m tonnes)	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World copper mine production	**14.97**	**15.50**	**15.55**	**15.20**	**15.85**	**16.50**	**17.15**	**17.85**
% change	**0.0%**	**3.5%**	**0.3%**	**-2.2%**	**4.3%**	**4.1%**	**3.9%**	**4.1%**
of which South America	6.74	7.15	6.94	6.65	7.20	7.60	8.10	8.25
Change %	0.9%	6.1%	-2.9%	-4.2%	9.0%	4.8%	6.6%	1.9%
of which Asia (including China)	2.77	2.88	2.95	3.20	3.50	3.40	3.45	3.75
Change %	-3.3%	3.8%	2.5%	8.6%	9.4%	-2.9%	1.5%	8.7%
Disruption allowance & market adjustment				0.40	1.00	1.05	1.05	1.10
World refined copper production	**17.25**	**17.92**	**18.08**	**17.40**	**17.95**	**18.70**	**19.45**	**20.20**
% change	**4.3%**	**3.9%**	**0.9%**	**-3.8%**	**3.2%**	**4.2%**	**4.0%**	**3.9%**
of which China	3.00	3.50	3.76	3.80	4.20	4.45	4.80	5.15
% Change	14.4%	16.7%	7.5%	1.1%	10.5%	6.0%	7.9%	7.3%
of which South America	3.63	3.67	3.72	4.00	4.10	4.25	4.30	4.25
% change	0.7%	1.0%	1.5%	7.5%	2.5%	3.7%	1.2%	-1.2%
Disruption allowance & market adjustment				0.50	1.10	1.05	1.15	1.15
World refined copper consumption	**17.37**	**18.03**	**17.72**	**16.65**	**17.80**	**18.85**	**19.65**	**20.40**
Change (%)	**3.2%**	**3.8%**	**-1.7%**	**-6.0%**	**7.0%**	**6.0%**	**4.2%**	**3.8%**
of which China	4.00	4.66	4.89	5.60	6.05	6.60	7.15	7.70
% change	4.9%	16.5%	5.0%	14.5%	8.0%	9.1%	8.3%	7.7%
of which total Asia	8.75	9.61	9.80	9.95	10.70	11.45	12.15	12.85
% change	3.7%	9.9%	2.0%	1.6%	7.5%	7.0%	6.1%	5.8%
of which Europe	4.99	4.81	4.54	3.70	3.93	4.05	4.10	4.13
% change	8.0%	-3.7%	-5.6%	-18.5%	6.1%	3.2%	1.2%	0.6%
of which North America	2.69	2.65	2.38	2.05	2.15	2.23	2.25	2.25
% change	-7.1%	-1.6%	-10.1%	-13.9%	4.9%	3.5%	1.1%	0.0%
Implied market balance	**-0.12**	**-0.11**	**0.36**	**0.75**	**0.15**	**-0.15**	**-0.20**	**-0.20**
Actual/forecast reported stocks	1.13	1.02	1.15	1.15	1.40	1.30	1.20	1.10
Reported stock change	0.26	-0.11	0.13	0.00	0.25	-0.10	-0.10	-0.10
Stock: consumption ratio (weeks)	**3.4**	**2.9**	**3.4**	**3.6**	**4.1**	**3.6**	**3.2**	**2.8**
LME spot price (US$/tonne)	**6,729**	**7,125**	**6,951**	**5,075**	**6,750**	**7,250**	**8,250**	**9,000**
LME spot copper price US¢/lb	**305**	**323**	**315**	**230**	**305**	**330**	**375**	**410**
Change (%)	**83%**	**6%**	**-2%**	**-27%**	**33%**	**7%**	**14%**	**9%**

Source: CRU, ICSG, RBS estimates and forecasts

Demand forecast should recover by 7% in 2010

Chinese net imports of refined copper (000t) soared in H1 09



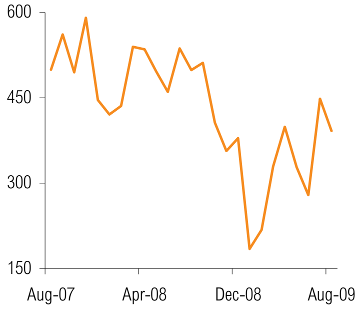
Source: Chinese General Administration of Customs, RBS

We believe real copper demand is now finally on the turn. However, despite the excellent price recovery and China's manifest voracious appetite to date, we continue to forecast that real global demand for refined copper will decline by fully 6% this year, taking it back to the level of 2004. But the contrast between China and the rest of the world and between the first and second halves is vast. We estimate that demand plunged by close to 10% yoy in H1 09, but comprising a surge in China of 15-20% outweighed by a roughly 20% collapse elsewhere. These estimates differ greatly from those of the International Copper Study Group (ICSG) and the World Bureau of Metal Statistics (WBMS). Both show a decline globally of less than 1% yoy due to explosive growth in China of nearly 50%, but they do not allow for Chinese stockpiling activity.

Apparent demand greatly boosted by Chinese stockpiling

Whichever of the available production series is used, a simple calculation that also factors in soaring imports (plus small changes in SHFE stocks) points to growth in Chinese apparent demand for refined copper in H1 09 of well over 40% yoy. Chinese refined demand was boosted hugely by a plunge in availability and imports of direct use scrap (scrap for refining is first a supply side item) but this figure still does not look credible as a measure of real demand. Based on our estimate of real Chinese refined demand, we conclude that there was a build-up of copper stocks in China of 600-650kt in H1 09, on top of c250kt in Q4 08. The true figure may be even higher. The reported purchase of 235kt by China's State Reserves Bureau (SRB) accounted for only about 25% of all this. Some of the rest could have been consumer restocking, but much may have been more speculative hoarding by consumers, traders and others.

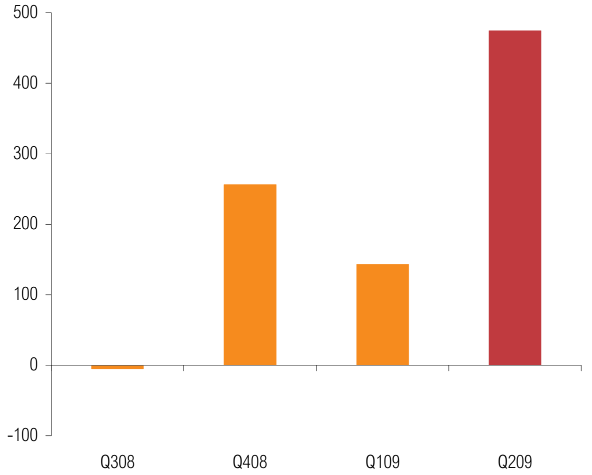
Chinese imports of copper scrap (000t) plummeted in early 2009



Source: Chinese General Administration of Customs, RBS

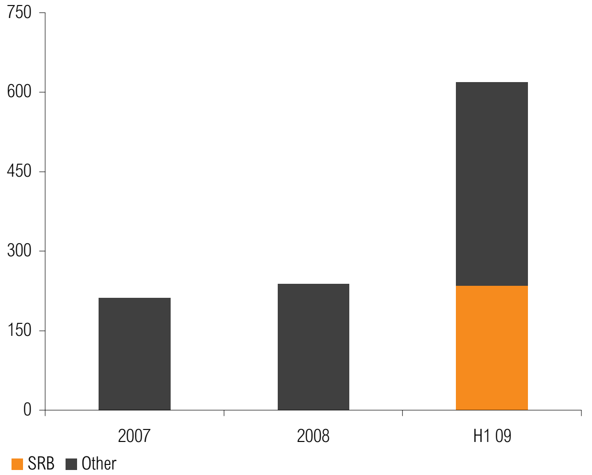
The timing of the SRB's purchase may have been opportunistic, but the strategic stockpile of copper, of which China is structurally short, was in need of replenishment following big releases in 2004-06. We expect the SRB to hold onto its now larger stockpile, perhaps selling only in an emergency. But much of the material from other Chinese stockpiles may find its way back into the market in the coming years. In the shorter term, Chinese imports are likely to continue to decline from their June peak, especially as the LME-SHFE price arbitrage has moved in recent months so as to make them unprofitable.

Implied buildup of unreported stocks of refined copper in China – perhaps 0.9mt over Q4 08 to Q2 09



Source: CRU, Chinese General Administration of Customs, RBS

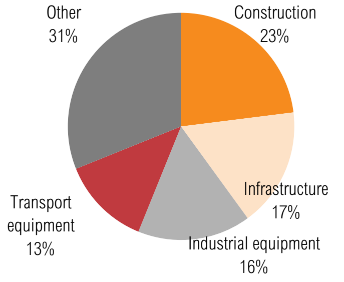
Implied buildup of unreported stocks of refined copper in China – much in addition to SRB buying



Source: CRU, Chinese General Administration of Customs, RBS

Solid cyclical recovery, but structurally more challenged

World copper demand by final market – the cycle is turning

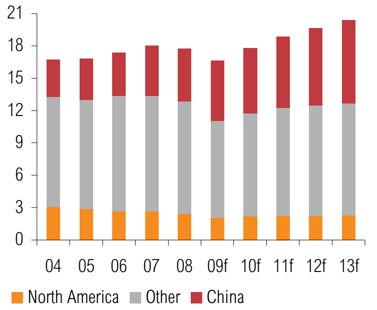


Source: CRU, RBS

Turning back to real demand, we have seen signs of stabilisation outside China in recent weeks but no great pickup, while Chinese growth is unlikely to have accelerated further as scrap has become more readily available. However, we expect solid yoy growth in world copper demand in Q4 09 as a result of an improvement in global industrial activity and favourable base effects (demand fell by 8-9% yoy in Q4 08). This sets the scene for a strong recovery next year. There is certainly much lost ground to be made up; non-Chinese demand may have fallen 17% between 2007 and 2009, while combined European, Japanese and North American offtake may this year be 27% below its 2006 level.

Although some areas of the economy may remain soft, copper is tied more closely than most metals to infrastructure building, which should remain a bright spot. We forecast that world refined copper demand will recover by about 7% in 2010, even though Chinese growth is likely come off the boil after this year's surge. The swing ex-China may be from minus 14% to plus 6% or so. Yet this would leave global demand still just shy of its 2007 level and non-Chinese offtake over 10% short, which suggests that there will be scope for further above-trend growth in the following year. We forecast roughly 6% growth for 2011.

World refined copper demand, 2004-13F – may bounce 7% in 2010



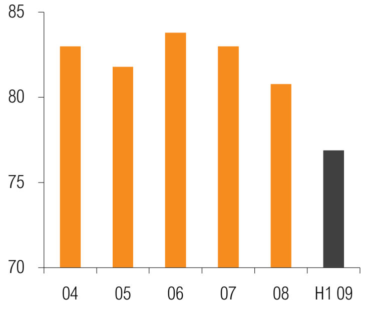
Source: CRU, RBS forecasts

However, it is important to distinguish between cyclical factors and structural trends. First, the soft trend in non-Chinese and especially developed world copper demand has been largely due to migration of basic manufacturing to China, which is likely to continue. More importantly, despite all the commentary about the market for copper being fundamentally very strong, the global CAGR between 2001 and 2007 (ie trough to peak) was less than 4% pa, no faster than lead and zinc, and slower than copper achieved in previous, less economically vigorous cycles. This was partly due to substitution as the copper price soared, not only absolutely but also relative to competing materials, but we expect pressure here to re-intensify in the coming years. Indeed, we would strongly advise consumers to redouble their efforts to substitute away from copper.

We forecast that world copper demand growth will slow down in 2012-13 to about 4% pa. This would still leave the CAGR between 2009 and 2013 at over 5% pa, which may appear on the high side given our observations above. But it essentially reflects the fact that the trough of 2009 has been deeper than that of 2001. Our forecasts have Chinese growth coming down to around 8% pa over the period and non-Chinese demand still below its 2007 peak even in 2013.

Supply-side constraints continue to mount

Copper refinery capacity utilisation (%) very low in H1 09



Source: ICSG, RBS

The reason we believe substitution pressures will re-intensify in the coming years is not so much the inherent strength of demand as the difficulty producers may again have in keeping up with growth. Copper remains at heart a supply side story and this largely explains the speed and extent of the price recovery this year despite a substantial underlying surplus.

The supply issues chiefly concern mines rather than smelters and refineries, where capacity is and will in our view should remain ample. World copper refinery capacity utilisation dropped to a record low 77% in H1 09, according to ICSG data, due primarily to smelter cutbacks over the past year that at their peak amounted to an estimated 9% of 2008 world production. We forecast that global refined output will fall by up to 4% this year. Capacity utilisation could readily be ramped back up to at least the levels of 2004-07 were wider market conditions to allow. Moreover, world smelter capacity appears set to increase strongly in the coming years, with China alone having plans for nearly 2mtpa of new plant in 2010-13, albeit that country does contribute the lion's share of growth.

Selected price-related production cutbacks in the copper industry since mid-2008; (reactivations highlighted in red)

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Bagdad/Miami/Sierrita, Freeport, US	Announced October 2008	To delay Miami restart	And defer expansions at Bagdad/Sierrita
Tsumeb et al, Weatherly Intl., Namibia	Implemented November 2008	Closed Tsumeb West/Matchless	And small cuts at Otjihase/Tschudi
Mukondo/Kakanda/Luita, CAMEC, DR Congo	Implemented November 2008	All closed, 07/08 production 30kt	Luita restarted April 2009
Tilwezembe, Katanga Mining, DR Congo	Implemented November 2008	Closed, production ~5kt/y	
Trojan/Shangani, Bindura Nickel, Zimbabwe	Implemented November 2008	Closed, combined capacity ~4kt/y	
Myra Falls, Breakwater Resources, Canada	Announced November 2008	Was to close ~13kt/y mine but revoked	
Langlois, Breakwater Resources, Canada	Implemented November 2008	Closure of ~4kt/y mine	
Aljustrel, Lundin Mining, Portugal	Implemented November 2008	Closure, was to build up to 3kt/y	
Tritton, Straits Resources, Australia	Announced November 2008	Was to produce 35kt in 09, now 25kt	
Craig/Thayer-Lindsley, Xstrata, Canada	Announced November 2008/February 2009	To close both mines early, Feb 2009	Combined capacity was ~15kt/y
Copper Cliff South, Vale, Canada	Announced December 2008	To close ~10kt/y mine	
Voisey's Bay, Vale, Canada	Announced December 2008	To close for one month in July 2009	Loss, ~3kt
Four mines in Peru/Chile, Freeport	Announced December 2008/January 2009	Cuts and deferral of expansions	Combined 2010 prod ~90kt less
Chino/Morenci/Safford/Tyrone, Freeport, US	Announced December 2008/January 2009	To close Chino, 50% cutbacks at others	Combined cut 180kt in 09, 270kt in 2010
Chambishi, CNNC, Zambia	Implemented December 2008	Closed 50kt/y operations	
Dikulushi, Anvil Mining, DR Congo	Implemented December 2008	Closed mine that was expanding to 15kt/y	
Baluba, Luanshya Copper Mines, Zambia	Implemented December 2008	Closed 35kt/y mine	CNMC to restart Q4 09
RZB Bucim, Macedonia	Announced January 2009	To close ~9kt/y mine	
Mowana, African Copper, Botswana	Implemented January 2009	Closed 20kt/y mine	Restart September 2009
Lince, Antofagasta, Chile	Announced January 2009	To close open-pit section, loss ~7kt/y	
Pinto Valley, BHP Billiton, US	Announced January 2009	To close ~60kt/y concentrate mine Feb 09	
Kazakhmys, Kazakhstan	Announced January 2009	To cut 2009 output by 10-15% from 371kt	
Fraser/Fraser Morgan, Xstrata, Canada	Announced February 2009	To close ~9kt/yFraser, defer Fraser Morgan	
Mufulira, Mopani Copper Mines, Zambia	Announced March/April 009	Wanted to close 90kt/y conc. + SX-EW mine	But decision reversed
Nkana, Mopani Copper Mines, Zambia	Announced March/April 2009	Wanted to close 120kt/y conc. + SX-EW mine	But decision reversed
Sudbury operations, Vale, Canada	Announced April 2009	To close 90kt/y for 8 weeks in Q2/Q3 2009	In addition to maintenance closure in May
Smelters/refineries			
Shandong Jinsheng, China	Implemented September 2008	Closed 80kt/y plant	
Ningbo Jintian, China	Implemented October 2008/March 2009	Cut to 90kt/y from ~180kt/y	
Tongling NFM, China	Announced October 2008	Cut may be 10-20% of 650kt/y capacity	
Daye NF, China	Implemented November 2008	To cut 10% of 280kt/y	
Kyshtym/Novgorod, Russian Copper, Russia		Cut by ~45kt/y in 2008	
Jintian, China		Cutting >90% of 200kt/y	
Fuchunjiang, China		Cutting 33% of 120kt/y	
Yantai Penghui, China		Cutting 25% of 100kt/y	
Shanghai Xinye, China		Cutting 15-20% of 60kt/y	
Pan Pacific Copper (Nippon/Mitsui), Japan	Announced December 2008/March 2009	Cut by 10% of 610kt/y capacity	Until at least September 2009
Toyo, Sumitomo, Japan	Announced January 2009	Cut by 14% at 450kt/y plant	Annualised 60kt for H1 09
Onsan, LS-Nikko, South Korea	Announced January 2009	Cut by 10% of 570kt/y, ~55kt/y	
Naoshima/Onahama, Mitsubishi, Japan	Announced January 2009	To cut both by 10%, ~50kt/y	Back at full capacity August 2009
Gresik, Mitsubishi, Indonesia	Announced January 2009	To cut by 10% at 275kt/y plant	
Kazakhmys, Kazakhstan	Announced January 2009	To cut 2009 output by 10-15% from 340kt	
Harjavalta/Ronnskar, Boliden, Finland/Sweden	Announced January 2009	Cut by combined annualised 68kt/y in Q1 09	
Yunnan Copper, China	Announced February 2009	To produce 35kt less in 2009 than in 2008	Had already cut output in 2008
Hayden/Amarillo, Asarco, US	Announced March 2009	Smelter maintenance closure in Q2 09	Small cuts at refinery, prod <180kt/y
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 55kt/y plant	Due to financial/environmental problems
Tamano JV, Japan	Announced April 2009	Cut by 21% in H1 09/10 at 260kt/y plant	
Copper Cliff, Vale, Canada	Announced April 2009	To close 120kt/y for 8 weeks in Q2/Q3 2009	In addition to maintenance closure in May
Kidd Creek, Xstrata, Canada	Announced April/August 2009	Closing ~135kt/y plant for 15-18 weeks in 09	Weak H_2SO_4 market & conc. shortage

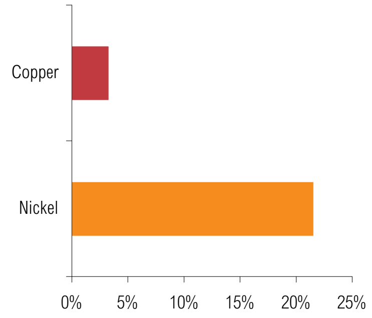
Source: Company reports, Reuters, Bloomberg, RBS

A substantial portion of the decline in refined copper production this year has come from a decrease in the processing of secondary material; the ICSG estimates a drop in world secondary refined output in H1 09 of 7% yoy. This is partly due to the cutbacks, but in addition, less scrap feed has been available. Availability should improve as economic activity picks up and we expect a secular uptrend as industrialisation broadens and deepens among developing nations. So we come back to whether there will be sufficient mined copper.

Potential growth in copper mine production can be put into three broad categories: 1) reactivation of capacity closed in late 2008 and 2009 in response to poor market conditions; 2) possible improvement in operating performance; and 3) net capacity growth.

Few copper mine cutbacks, so few restarts

Mine cutbacks as % of 2008 world output – little action in copper



Source: RBS

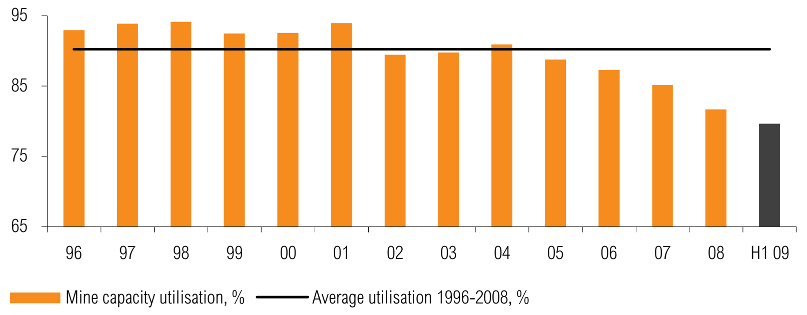
We estimate that about 0.5mtpa of copper mine capacity closed in response to the collapse in demand and price of H2 08, **representing little more than 3% of world mine production in 2008**, far less than in other base metal industries. This is not surprising to us because copper was the last metal to succumb to the recession and even when it hit bottom in December 2008, the bulk of the mining industry was cash positive. Yet little of the closed copper capacity has so far restarted. The appreciation of key producer currencies has put upward pressure on costs, a portion of the capacity is dependent on other metals and some producers may still be wary of the economic outlook. Nevertheless, we expect most of the shut mine capacity to reopen over the next 12 months. But the plain fact is that in contrast to other metals, there is simply not that much to be restarted.

We forecast that world mine production will decline by only about 2% this year, assuming there are no major supply disruptions in the final months, in particular strikes in Chile. But by the same token, restarts alone will only boost it by 3% annualised over 2010-11, a period in which demand is expected to rebound by much more. The restarts on their own will barely do more than take capacity utilisation back up to the very low level of last year, as estimated by the ICSG.

Mine capacity utilisation shows few signs of improving

Even before the recent cutbacks had a material impact, between 2002 and 2008 world copper mine production rose by only about 15%, or less than 2.5% pa, despite the copper price more than quadrupling over the period. This must ring alarm bells for the supply outlook.

Copper mine capacity utilisation has been deteriorating for several years – so much so that it is very likely that the ICSG overstates effective capacity



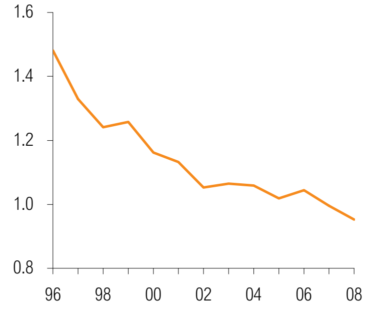
Source: ICSG, RBS

ICSG data suggests the slow pace of growth was due not so much to sluggish capacity growth over the period, which it puts at a reasonably healthy 3.5% pa or so, as to a sharp decline in capacity utilisation. The ICSG's latest estimate is that world copper mine capacity utilisation in H1 09 was 2 percentage points down from the average last year. This looks plausible given the cutbacks, but harder to explain is the heavy fall since at least 2004 to less than 80%. It might appear to point to much potential for improvement, but so remorseless has the decline been that we think it likely that the ICSG has increasingly overstated **effective** (as opposed to theoretical nameplate) global capacity.

One factor holding back copper production growth in recent years and probably contributing to the overstatement of capacity has been the tendency of new mines and expansions to start up late and take longer than planned to reach full output. This has been due to a range of constraints including shortages of manpower, materials and equipment. More significant is that many existing mines have struggled to maintain production levels in the face of the same and other constraints such as shortages of replacement trucks and tyres, energy and water. Copper mines have been particularly exposed to such constraints. The copper industry has also been hit harder than most by equipment breakdowns, accidents and strikes. Perhaps most significant of all has been a decline in ore grades. The giant Escondida mine is an albeit extreme example of such problems, with copper-in-concentrate production in H1 09 down fully 40% yoy.

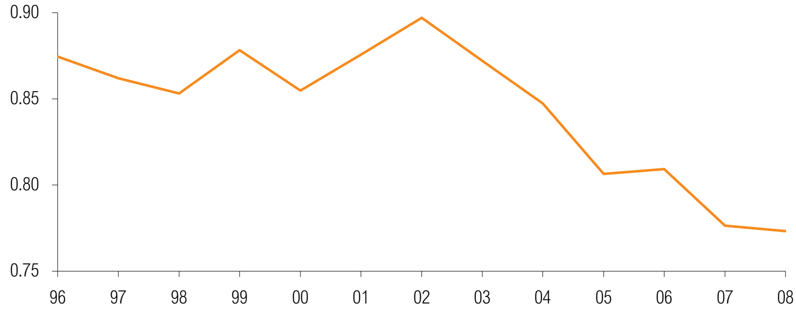
Some of the constraints of recent years were in part creatures of the commodity and wider economic boom, so are likely to have eased as recession has reduced strains on infrastructure generally and on energy and water supplies in particular. However, cuts in investment mean that such problems may well re-intensify in the medium term, while they are chronic in certain key copper regions, notably Chile (water) and Zambia (electricity). Likewise, faults and accidents caused by plants being pushed hard in the boom times may now be replaced by problems resulting from cuts in maintenance expenditure and the paring of inventories of replacement equipment. Neither do we see any reason to believe natural hazards such as earthquakes will diminish.

Weighted average copper head grade in Chile, %



Source: CRU, RBS

Weighted average global copper head grade (%) has declined sharply in recent years



Source: CRU, RBS

Research by CRU shows that after a decade of trending up, the weighted average global head grade at copper mines declined by 15% between 2002 and 2008. Geographically, this was driven mainly by developments in Chile, where grades have been falling sharply ever since the mid-1990s. Globally, it has been due both to lower tallies at new capacity and declines at existing mines, where producers have struggled to compensate by boosting ore throughput. The coincidence between the aggregate trend and the decline in ICSG mine capacity utilisation is striking, even if it can provide only a very partial explanation of the latter. Although new projects in the African Copperbelt could slightly raise the world average grade in the short term, we expect the downward trend to resume in the medium term and probably longer term, too.

Drawing all this together, we conclude that beyond a rise next year as the cutbacks are unwound, there are few grounds to expect much further recovery in copper mine capacity utilisation as the ICSG measures it. Put another way, it seems probable that effective capacity at many facilities is now permanently lower, and it is possible that the aggregate capability of steady-state mines will continue to decline in the coming years. Either way, new mines/expansions will have to do the heavy lifting in meeting copper demand in the coming years.

No big pick-up in copper mine capacity growth – few 'copper whoppers'

We continue to highlight the paucity of big new copper mines due on-stream in the next four or five years, and certainly nothing to compare with **Escondida**. Three projects – greenfield **Oyu Tolgoi** in Mongolia and **Tenke Fungurume** in DR Congo, and expansion at **Collahuasi** in Chile – each have the potential to produce over 400ktpa, but not until the middle of the next decade.

This does not necessarily matter if there are enough medium-size and small developments, but another concern is that the credit crunch and recession led to mining companies slashing capital expenditure and slow-tracking or even cancelling projects, with copper far from immune. Nevertheless, there are many small and medium-size new mines and expansions due onstream by 2013. The table below lists a selected 15 of these based on CRU data. Moreover, recent weeks have seen a flurry of announcements about other projects now being fast-tracked for possible start-up before the end of 2013, although for some of these the timing looks rather ambitious.

Top six copper mines – 2008 output and share of world total

	000t	% of total
Escondida	1,250	8.0%
Codelco Norte	763	4.9%
Grasberg	521	3.4%
Collahuasi	464	3.0%
Norilsk	404	2.6%
El Teniente	391	2.5%
World total	15,548	

Source: Brook Hunt, RBS

Planned production at selected mines contributing to copper mine capacity growth in 2009-13 (000t) – where are the 'copper whoppers'?

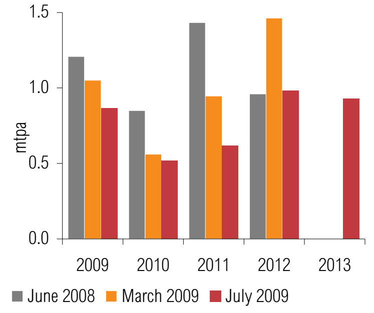
Mine	Company	Country	Type *	2008A	2009F	2010F	2011F	2012F	2013F	Addition 2008-2013
Los Bronces	Anglo American	Chile	C/E	190	144	209	234	376	418	**228**
Grasberg	Freeport	Indonesia	C/E	521	691	739	530	530	744	**223**
Esperanza	Antofagasta	Chile	C/G	-	-	24	100	180	190	**190**
Collahuasi	Anglo American/Xstrata	Chile	C/E	415	425	425	505	591	591	**176**
Radomiro Tomic	Codelco	Chile	C/G	-	-	80	150	160	160	**160**
Lumwana	Equinox Resouces	Zambia	C/G	8	120	200	163	156	159	**151**
Konkola/Konkola Deep	Konkola Copper	Zambia	C/E	40	50	60	73	92	173	**133**
Toquepala	Southern Copper	Peru	C/E	114	120	155	188	219	246	**132**
Gabriela Mistral	Codelco	Chile	X/G	71	145	164	178	201	201	**130**
Caserones	Regalito Copper	Chile	C/G	-	-	-	-	49	130	**130**
Tia Maria	Southern Copper	Peru	X/G	-	-	-	105	120	120	**120**
Batu Hijau	Newmont	Indonesia	C/E	129	207	215	244	244	244	**115**
Tenke Fungurume	Freeport/Tenke	DR Congo	X/G	0	64	100	115	115	115	**115**
Prominent Hill	OZ Minerals	Australia	C/G	-	75	105	107	107	107	**107**
Salobo	Vale	Brazil	C/G	-	-	-	63	100	100	**100**
Subtotal				**1,488**	**2,041**	**2,475**	**2,755**	**3,241**	**3,697**	**2,209**

* C = concentrate, X = leach/SX-EW, E = expansion, G = greenfield

Source: CRU, RBS

As to overall net copper mine capacity growth, there has been a clear pattern in recent years among the three organisations we consult to lower their forecasts due to project delays and downward revisions to estimated effective capacity at existing mines. ICSG's most recent forecast of net growth in world copper mine capacity between 2009 and 2013 is 15-16%, an average of a little over 3.5% pa. The methodologies of CRU and Brook Hunt are different and more complex, but although CRU's growth projections are rather higher, Brook Hunt's final baseline forecast of net copper mine capacity growth over the period is very similar to that of ICSG. It is quite possible there will be yet more project delays, but against this some projects do appear to be moving ahead faster than appeared likely earlier

ICSG has steadily cut its copper mine capacity growth forecasts



Source: ICSG, RBS

this year. Our working assumption is that growth of 3.5-4.0% pa looks about right, if skewed towards the end of the 2010-13 period.

Production growth unlikely to exceed 4% pa – watch out for strikes

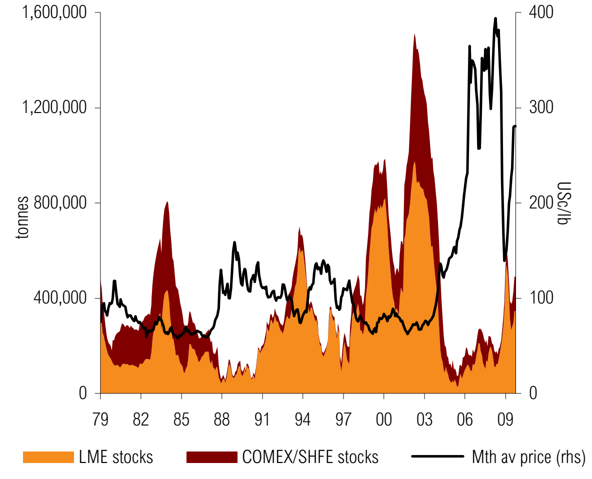
In conclusion, the combination of restarts, modest capacity growth and few signs of a material improvement in operating performance will confine world copper mine production to increasing by about 4% pa. out to 2013. Growth in 2010 could be a little faster as cutbacks are unwound, **but labour contracts at mines accounting for over 2mtpa of capacity (mostly in Chile) run out in the next nine months and strikes cannot be ruled out.** Even without strikes, we believe the concentrate market will remain tight in both the short and the medium term, so we do not expect refined copper output to grow any faster than mine production. Smelters may even hold back next year in order to replenish severely depleted concentrate stocks.

Outlook − prepare for a new all time price high

In terms of market outlook, copper remains our most favoured base metal, even though its price gains from present levels may not be the greatest. The latter simply reflects copper's already excellent recovery from its December 2008 low; at best the copper price has surged by 130%, recouping 60% of its previous losses. We favour copper not so much for its fundamentals today, but rather for the medium-term outlook. We do not consider copper's demand prospects among the best, but we believe the copper-producing industry will have the most difficulty keeping up with growing demand. We forecast that the copper market will be back in underlying deficit by 2011 and that by 2013 it will be fast approaching pre-recession tightness. Uniquely among the base metals, we forecast a new record high copper price, perhaps as soon as 2012.

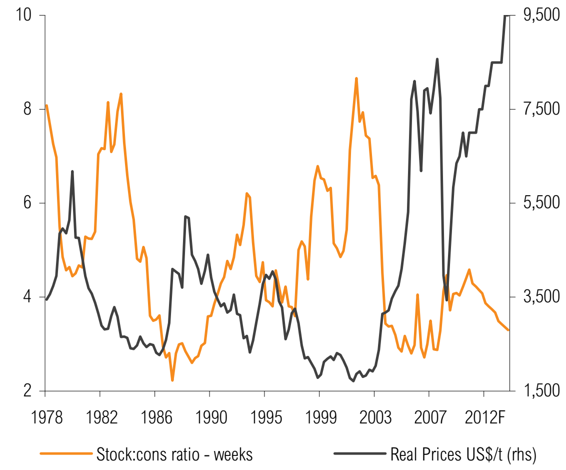
The extent of copper's price recovery to date suggests that the market shares our view, for copper still has some work to do before all the stars are aligned. Although reported commercial-sector inventories rose by less than 150kt in 2008 and are net little changed so far this year, we estimate an underlying surplus of about 350kt last year and forecast fully 750kt for 2009. We believe the 'missing' roughly 1.1mt of metal has mostly gone into stockpiles in China. Some of this material may have been effectively quarantined, but much may find its way out into the market in the coming years, thereby easing the path back to underlying deficit. Partly for this reason, we expect further price progress in 2010 and into 2011 to be much more modest than that seen this year.

Copper exchange stocks and price – stocks remain historically low



Source: LME, SHFE, COMEX, RBS

Copper stock:consumption ratio and real price – inventory cover expected to drop from 2011



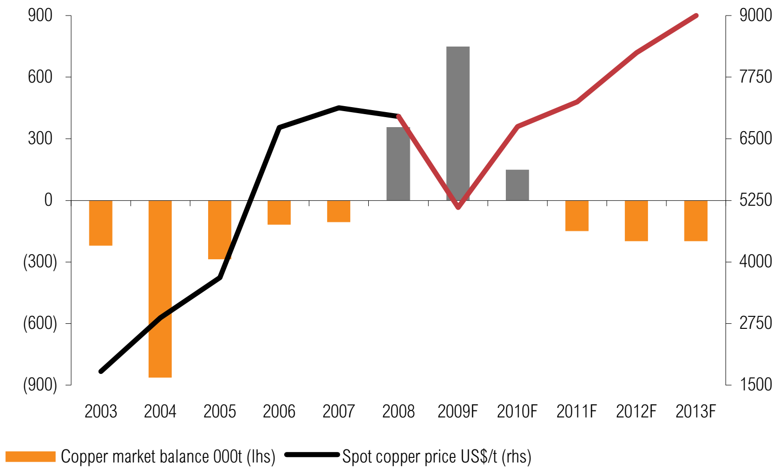
Source: LME, ICSG, CRU, RBS

Nevertheless, we forecast that the average LME cash copper price will leap by over 30% next year and that in 2011 it will reach or slightly exceed the record level of 2007. Thereafter, we expect the price to escalate further forcing substitution and demand destruction, and market conditions may be such as to persuade China's State Reserves Bureau to release some material from its strategic stockpile. We forecast a mean copper price in 2013 of $9,000/t, above even the fleeting peak of mid-2008. Fireworks indeed.

Our new price forecasts for 2010-12 represent upward revisions of 20-25%. Whilst we see clear downside risks on the economic front, so bullish are the supply side fundamentals that the biggest risk to our projections may be of price escalation being brought forward.

We have also raised our forecast of the long-term average copper price, by nearly 30% to $4,950/t (US$2.25/lb). This is partly on currency considerations, not only the recent weakening of the US dollar but also the strengthening of key producer currencies. Given too the serious market tightness expected in 2012-13 and potentially beyond, it seems likely that a higher price will be needed to entice onstream enough new mines to balance the copper market over the longer term.

World copper supply/demand surplus and deficits, 2003-13F; back to underlying deficit from 2011, price forecast to hit new record highs

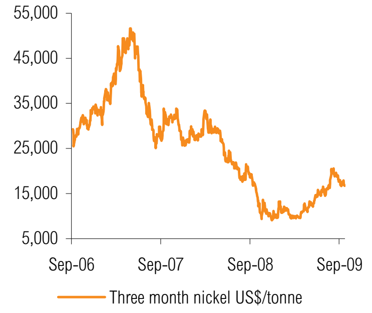


Source: CRU, LME and RBS forecasts

Nickel

Back from the abyss – but too fast and too early?

Nickel clawing back from the abyss. But too fast, too early?



Source: LME

Nickel was one of the worst-performing metals of 2008, but its price has had a spirited run during 2009, doubling from its lows. However, nickel is still deservedly 70% lower than its notable record high of US$54,050/tonne seen in May 2007. But in our opinion, the price recovery has been too fast and too early and is vulnerable to a relapse. Why is this? Nickel faces a potent and not swiftly eradicated legacy of this recession. We see three key issues: 1) how to erode 0.120mt of LME inventory now at over 14 year highs with total reported stocks of nearly 13 weeks of demand; 2) how to manage the reactivation of 0.300mtpa or 21% of world nickel capacity; and 3) how to cope with a parade of new nickel mines due onstream over 2010-13.

The answer has to be driven by the impending recovery in world stainless steel production, but it will take time. World stainless steel production will this year register its third consecutive year of contraction. In 2007-09, we estimate that stainless steel production fell by an unprecedented 5mt, or 18%. Over the same period, nickel consumption contracted by 12% or 0.170mt. We forecast that both stainless steel and finished nickel demand will snap sharply higher post 2009 as the business cycle gets into its stride. We estimate that the cumulative surplus between 2007 and 2013 will total 0.290mt. We forecast spot nickel will average 2009 at US$14,765/tonne, 60% lower than in 2007 and 30% lower than 2008. We forecast supply deficits in 2012-13 will see the return of pricing tension and we have pencilled in a 2013 average price of US$23,000/tonne, around 30% higher than the current price. Mainly reflecting a weaker US dollar, we have raised our long-term nickel price by 13% to US$15,000/tonne (US$6.80/lb).

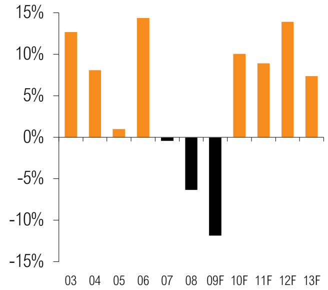
RBS world nickel market supply/demand balance, 2006 -13F; demand should snap higher, but so too supply

000 tonnes	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World stainless steel production, mt	**28.44**	**28.31**	**26.50**	**23.35**	**25.70**	**28.00**	**31.90**	**34.25**
% change yoy	**14%**	**-1%**	**-6%**	**-12%**	**10%**	**9%**	**14%**	**8%**
of which China	5.30	7.28	6.91	8.50	9.35	10.75	12.50	14.25
% change yoy	44%	37%	-5%	23%	10%	15%	16%	14%
of which Europe	9.56	8.36	8.08	5.55	6.10	6.50	7.50	8.25
of which US	2.50	2.17	1.93	1.60	2.00	2.25	2.35	2.50
World finished nickel production	**1,345**	**1,430**	**1,380**	**1,280**	**1,395**	**1,485**	**1,620**	**1,725**
Change %	**5.1%**	**6.3%**	**-3.5%**	**-7.5%**	**9.0%**	**6.5%**	**9.0%**	**6.5%**
of which Russia	275	268	258	235	255	265	275	280
of which Canada	156	162	176	130	150	150	150	155
of which Japan	150	158	153	125	140	160	175	180
of which Australia	117	115	109	120	120	120	125	125
Disruption allowance	-	-	-	10	45	75	85	80
World finished nickel consumption	**1,405**	**1,340**	**1,275**	**1,235**	**1,360**	**1,470**	**1,665**	**1,800**
Change %	**12.0%**	**-4.5%**	**-5.0%**	**-3.0%**	**10.0%**	**8.0%**	**13.5%**	**8.0%**
of which total Asia	689	706	677	725	800	875	1,000	1,100
of which China	260	345	350	400	460	520	615	700
% change yoy	41%	32%	2%	14%	15%	13%	18%	14%
of which Europe	490	425	410	330	365	390	430	450
% change yoy	8%	-13%	-4%	-20%	11%	7%	10%	5%
Implied market balance	**-60**	**90**	**105**	**45**	**35**	**15**	**-45**	**-75**
Reported stock	155	200	255	300	320	335	290	215
Stock: consumption ratio (weeks)	**5.7**	**7.8**	**10.4**	**12.6**	**12.2**	**12.0**	**9.0**	**6.2**
LME spot nickel US$/tonne	**24,275**	**37,167**	**21,020**	**14,700**	**15,500**	**17,500**	**19,250**	**23,000**
LME spot nickel US$/lb	**11.00**	**16.86**	**9.53**	**6.67**	**7.05**	**7.95**	**8.75**	**10.45**
Change %	65%	53%	-43%	-30%	5%	13%	10%	19%

Source: CRU, WBMS, LME, INSG and RBS forecasts

Demand – stainless steel output is recovering

Swings in annual world stainless steel growth, 2003-13F (%)



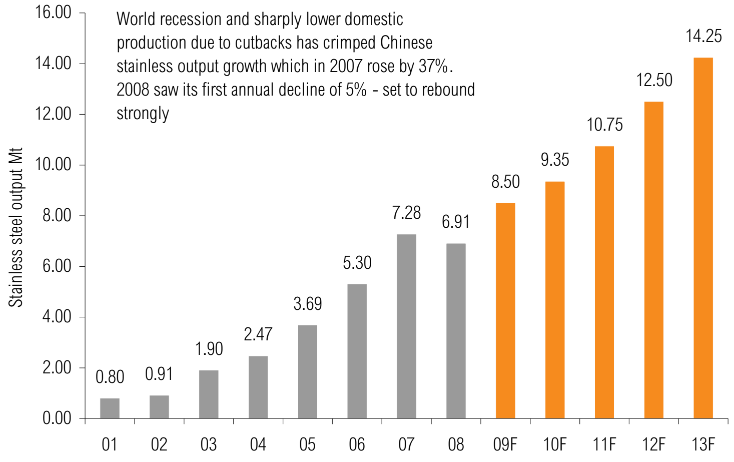
Source: CRU and RBS forecasts

Austenitic stainless steel (has a nickel content of at least 7%) is nickel's dominant end-use demand sector, accounting for about 60% of world refined nickel consumption. Non-stainless steel applications include nickel super-alloys in aerospace, castings and in batteries. Historically, world stainless steel production has grown at a trend rate of about 5% pa, well above the other metals. Growth rates yoy, however, exhibit wide swings, reflecting stocking and destocking cycles as well as periods of capacity additions and cutbacks. We forecast world stainless steel production in 2009 will fall 12% yoy to 23.35mt, taking output to a six-year low. The past three years of contracting stainless steel output have seen an 18% slump and wiped out over 5mt off world output.

However, although there is as yet no major improvement in underlying demand, we now see signs that the worst is behind the stainless market. Destocking by distributors appears to be over and European and North American stainless producers are beginning to express optimism in forward order books and production rates. Price rises have helped. For example, European stainless steel prices have risen 50% from their February 2009 low of €820-900/tonne to €1,230-1,280/tonne. Major European stainless producer Outokumpu, which operated at 50-60% capacity utilisation in H1 09, has announced that due to increased order intake, it will be increasing production capability at its key Tornio plant in Finland. In the US, Allegheny Ludlum in July announced its sixth price rise of the year for stainless cold rolled and hot rolled sheet and strip. Alloy surcharges have also risen, reflecting the rise in price of alloying metals such as nickel, ferrochrome, molybdenum and steel scrap.

But Chinese stainless output is leading the way, with several producers, such as Baosteel, now operating at high production rates. We estimate that Chinese stainless output will rise 23% in 2009 to a record 8.50mt. We expect CAGR growth from the world's biggest stainless steel producer of 14% pa through to 2013, when we forecast Chinese output will have added 5.75mt to 14.25mt. Other key producers should not be far behind and given stainless steel's leverage to world growth plus the base effect of three years of contraction, we forecast a handsome 10% rise in 2010 in world stainless steel output to 25.70mt. Between 2009 and 2013F, we have pencilled in an additional 10.90mt of output with a CAGR of 10% pa.

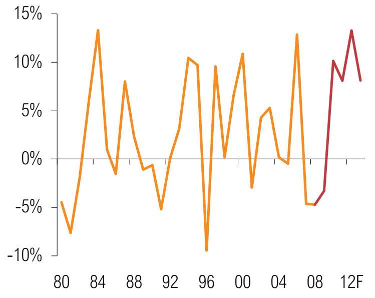
Chinese stainless steel production declined 5% in 2008, but already snapping back and set to rise over 20% in 2009.



World recession and sharply lower domestic production due to cutbacks has crimped Chinese stainless output growth which in 2007 rose by 37%. 2008 saw its first annual decline of 5% - set to rebound strongly

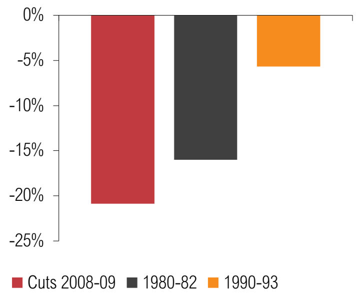
Source: CRU and RBS forecasts

yoy change in world primary nickel demand. Looks set to snap higher



Source: CRU, WBMS and RBS forecasts

Nickel mine production cuts, at 21%, exceed previous recessions



Source: Company sources and RBS

World nickel demand should rebound strongly in 2010-13F

The past three years have been harrowing for world refined nickel demand. The collapse in stainless offtake translated into markedly lower nickel offtake. We estimate that 2007-09 will have seen a 12% decline in nickel demand, representing the loss of 0.170mt of nickel. But there is good news – world refined nickel consumption is already rebounding. Look no further for the signs of this rebound than in the world's biggest nickel consumer, China.

We estimate that Chinese nickel demand in 2009 will rise 14% yoy to a record 0.400mt. Yes, some of this is apparent demand associated with a restocking episode. Nickel has been no exception to China's thirst for imports. Data from the Chinese General Administration of Customs for January-August shows that China has already imported a record 0.190mt of refined nickel, exceeding the entire 2008 imports of 0.118mt, which was at the time a record. We also note, though, that imports in August of 22,703 tonnes fell 52% mom from the record July high of 47,754 tonnes. This slowing is mirrored by other commodity imports. In a word, China has restocked ready to meet the upswing in world demand that is already beginning and should blossom in 2010 and beyond.

Nickel's broad spread of stainless steel applications and its use in low-ticket consumer items (eg white goods – dishwashers, washing machines etc.) tend to mean that nickel demand is in the vanguard of an upturn in the business cycle. We forecast that 2010 will see at least a 3.6% yoy rebound in world GDP growth. Our assumption is that this will lead to increased activity by the world's stainless mills, led by China. We forecast that our 10% increase in world stainless steel production for 2010 will be matched by a 10% increase in world nickel demand.

Yes, China should remain the driving force and in 2010, in consuming 0.460mt of nickel will account for nearly 35% of world nickel demand. By 2013, we forecast Chinese nickel demand will have risen to 0.700mt, or 39% of all nickel consumed. But close on China's tail should be strong rebounds albeit from desperately low bases in European and North American nickel consumption. Post-2009 through to 2013, we forecast world nickel consumption will rise by 0.565mt, representing a CAGR of 10% pa, double nickel's long-run average trend growth rate.

Supply – watch out for the reactivation parade

Bad things come in threes and for nickel, the past year has seen sharply rising nickel inventories, tumbling demand and slumping prices to below production costs. These led to a rash of nickel mine and smelter price-induced closures – the most notable scalp of the crisis was the closure of BHP Billiton's new 50,000tpa Ravensthorpe operation, but so too Xstrata's early cycle closure at its oil-fuelled, high cost 30,000tpa Falcondo ferro-nickel operation. We estimate that closures totalled 0.300mtpa or 21% of world production and the greatest capacity curtailment of any of the industrial metals. As our side-bar chart shows, these closures eclipsed those of the 1990-93 recession of around 6% and the 16% seen in the severe 1980-82 recession.

However, the nickel price has doubled since its December 2008 low, in August breaking above US$20,000/tonne. This has already led to thoughts of some price-induced reactivation and we think this will be a key theme for nickel over the next couple of years. We estimate that price and demand induced mine capacity additions between 2009 and 2013 could see an additional 0.517mtpa of capacity coming onstream. Additional capacity will embrace nickel sulphides and nickel laterite high-pressure acid leach projects as well as nickel pig iron producers.

Selected price-related production cutbacks in the nickel industry since mid-2008 (red indicates reactivation)

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Acoje, Rusina/DMCI, Philippines	Implemented June 2008	Closed ~6kt/y mine	Ore for Chinese NPI
Falcondo, Xstrata, Dominican Republic	Implemented August/December 2008	Closed 30kt/y plant for four months	Then indefinitely
Ufaleynickel/Reznickel, Ind. Met. Hdgs, Russia	Implemented August/October 2008	Cut by ~5kt/y, then closure of ~15kt/y	Partial restart in February 2009
Jinchuan, China	Implemented October 2008	Cut 2008 target output by 20kt, cut by 33%	
Yuanjiang Nickel, Sino-Platinum Metals, China	Implemented October 2008/January 2009	Closure of 5kt/y plant	
Shakespeare, Ursa Major, Canada	Implemented October 2008	Closure of new 4kt/y mine	
Cawse, Norilsk, Australia	Implemented October 2008	Closure of ~9kt/y mine	
Lockerby, First Nickel, Canada	Implemented October 2008	Closure of ~2kt/y mine	Aim to raise capacity towards 10kt/y
Levack/McCreedy West, FNX, Canada	Implemented October/December 2008	Closed Levack, then McCreedy West	Combined capacity ~6kt/y
PT Inco, Vale, Indonesia	Implemented October 2008	Cut of 20% at 78kt/y operations	
Onca Puma, Vale, Brazil	Announced October 2008/April 2009	Start-up of 58kt/y mine postponed to 2011	
Goro, Vale, New Caledonia	Announced October 2008	Delay in start-up and build-up to cap.	On stream start 2009, capacity to be 60kt/y
Eramet, New Caledonia	Announced October 2008	To cut 2009 target output from 62kt to 50kt	
Dalian, Vale, China	Announced October 2008	To stay at 35% utilisation of 32kt/y plant	
Berong, Toledo Mining, Philippines	Implemented November 2008/February 2009	Mine cut back, then closed, 2008 output ~7kt	Say price needs to be >US$18,000/t
Copernicus, Panoramic Res. et al, Australia	Implemented November 2008	Mine closed before reaching cap. of 2kt/y	
Black Swan/Waterloo, Norilsk, Australia	Implemented November 2008/February 2009	All closed in stages, combined cap. ~15kt/y	Black Swan o/p closed Feb 09
Trojan/Shangani, Bindura Nickel, Zimbabwe	Implemented November 2008	Closure of mines (5kt/y), smelter (~10kt/y)	
Craig/Thayer-Lindsley, Xstrata, Canada	Announced November 2008/February 2009	To close both mines early, Feb 2009	Capacities were 6kt/y and 3kt/y
PT Aneka Tambang, Indonesia	Announced November 2008/February 2009	To cut by cumulative ~7kt	
Miitel, Mincor, Australia	Implemented December 2009	Closed 5kt/y mine	
Copper Cliff South, Vale, Canada	Announced December 2008	To close ~8kt/y mine	
Voisey's Bay, Vale, Canada	Announced December 2008	To close for one month in July 2009	Loss, ~5kt
Hitura/Sarkiniemi, Belvedere Resources, Finland	Implemented December 2008	Both mines closed, combined capacity 3kt/y	
Avebury, OZ Minerals, Australia	Announced December 2008	To close, was to produce 8kt/y	China Metals may restart
Niihama/Hyuga, Sumitomo, Japan	Announced January 2009	Cut annualised combined 15kt in Q1-Q4 09	9kt at Niihama, 6kt in FeNi at Hyuga
Loma de Niquel, Anglo American, Venezuela	Announced January 2009	To close temporarily 17kt/y mine	
Ravensthorpe, BHP Billiton, Australia	Announced January 2009	To close indefinitely	Original target capacity 50-55kt/y
Fraser/Fraser Morgan, Xstrata, Canada	Announced February 2009	To close Fraser, defer Fraser Morgan	Fraser Morgan target cap. 8kt/y
Lake Johnston complex, Norilsk, Australia	Implemented February 2009	Closing mining complex with cap. ~14kt/y	
Munali, Albidon, Zambia	Implemented March 2009	Closed 10kt/y mine	Jinchuan to restart October 2009
Ferronikeli, Kosovo	Implemented March 2009	Cut by 50% at ~10kt/y operations	
Larco, Greece	Announced April 2009	Cutting 2009 prod by ~40% at 18kt/y ops.	
Sinclair, Xstrata, Australia	Announced April 2009	To close 6kt/y mine in August 2009	If market conditions do not improve
Sudbury operations, Vale, Canada	Announced April 2009	To close for 8 weeks in June/July 2009	In addition to maintenance closure in May
Rocky's Reward (Leinster), BHP Billiton, Australia	Announced May 2009	To close one of three mines at Leinster	Leinster capacity ~35kt/y
Santa Cruz, Semirara Mining, Philippines	Announced July 2009	Closed new mine with target cap ~10kt/y	
Chinese nickel pig iron industry		Big cuts and closures across industry	Some capacity restarted from Q2 09

Source: Company reports, Reuters, Bloomberg, RBS

Parade of reactivating, new and expanding nickel mines due onstream by 2013F (20,000 tpa cut-off)

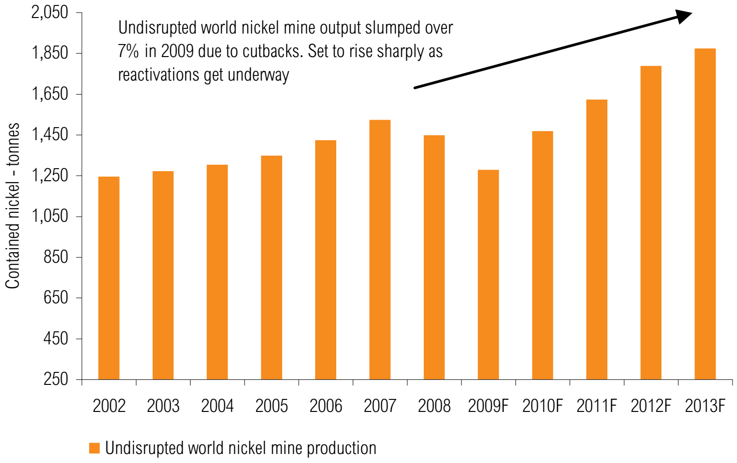
'000 tonnes	2008	2009F	2010F	2011F	2012F	2013F	2009 -13F
Goro - Vale, New Caledonia	0	5	25	35	50	65	60
Onca - Puma Vale Brazil	0	0	0	15	35	50	50
Barro-Alto - Anglo - Brazil	0	0	0	10	20	36	36
Norilsk - Russia	127	120	132	140	150	155	35
Talvivaara - Europe	0	8	23	30	35	40	32
Ramu River - PNG	0	0	5	10	25	30	30
SLN/Eramet - New Caledonia	55	53	63	70	80	80	27
Soroako - Vale Indonesia	72	65	65	70	85	90	25
Santa Rita - Brazil	0	5	15	20	25	25	20
Raglan - Xstrata	26	28	30	35	45	48	20
Caldag, European Nickel Europe	0	0	4	12	15	20	20
Australia - Forrestania	4	10	12	22	25	30	20
Others	67	74	118	156	188	215	140
Total yoy		**17**	**124**	**133**	**153**	**107**	**516**

Source: Company reports, CRU and RBS

The big projects to watch out for are Vale's 60,000tpa **Goro** and Vale's 50,000tpa **Onca-Puma** in Brazil. Anglo American report that its 36,000tpa **Barro Alto** mine, also in Brazil, is now 66% complete. Barro Alto has a 26-year mine life and is scheduled to come onstream in Q1 2011, with full production by Q3 2012. In Europe, increases at **Norilsk** should add 35,000tpa, while **Talvivaara** has confirmed that its new mine in Finland will reach 30,000tpa in 2010 and advised of plans to expand to 50,000tpa post 2012.

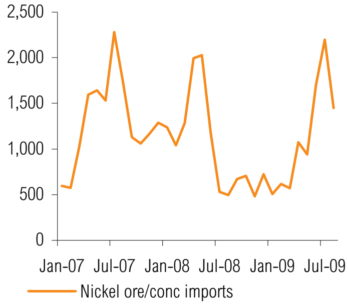
Meanwhile, Japan's largest nickel producer Sumitomo Metal Mining recently announced that it will start construction in March 2010 of its 30-year nickel-cobalt US$1.3bn **Taganito** project in the Philippines. The 30,000tpa Taganito will use a high pressure acid leach process and is scheduled to be onstream in August 2013. Vale's 46,000tpa **Vermelho** project is not expected onstream before 2013 and thus is not in our numbers. On the 2012-13 cusp is Xstrata's 60,000tpa **Koniambo.** The project was approved in October 2007, when spot nickel was around twice as high as it now at US$35,000/tonne (US$16/lb).

World nickel mine production about to surge post 2009. We forecast an additional 0.600mtpa on an undisrupted basis.



Source: CRU and RBS

Rapid recovery in imports of low grade ore to China for NPI '000t



Source: Chinese General Administration of Customs

Chinese nickel pig iron storms back on the scene

But watch out, nickel pig iron is also back on the scene. It's hard to believe, but pre-2004 therfe wasn't a Chinese ferro-nickel nickel pig-iron (NPI) business worth mentioning. However, the sustained period of elevated nickel prices in 2004-08 with a floor of US$15,000/tonne all the way up to the US$50,000/tonne marker opened the way for a whole new industry to develop. Record nickel prices made it economic to import low-grade limonite ores from the Philippines, Indonesia and New Caledonia. In 2003, ore imports were just 0.01mt, by 2006 3.78mt and in 2007 reached a substantial 15.56mt. The combination of onerous energy prices, high freight and the collapse in the nickel price saw port stocks of ore balloon and shipments plunge.

However, much has changed. Crude NPI blast furnaces have been upgraded, with more efficient electric arc furnaces that can service both 200 and 300 series stainless steel feed. Freight rates are a fraction of what they were and the oil price has halved, whilst the nickel price has snapped upwards. As a result, imports of ores are on the rise with imports in January-August 2009, though down 8% yoy, hitting 2.20mt in July, the second highest ever.

Imports of low grade nickel ores & concentrates into China are recovering with alarming speed. Nickel pig iron output already surging (tonnes)

	2005	2006	2007	2008	2009	YoY %	MoM%
Jan	1,516	18,081	596,640	1,235,096	507,268	-59%	-30%
Feb	6,401	18,002	573,516	1,039,435	615,969	-41%	21%
Mar	19,807	143,545	1,034,759	1,284,450	573,280	-55%	-7%
Apr	519	168,179	1,593,772	1,995,420	1,073,383	-46%	87%
May	10,075	150,614	1,641,898	2,029,098	939,708	-54%	-12%
Jun	18,943	257,258	1,530,707	1,179,256	1,700,927	44%	81%
Jul	20,931	257,815	**2,277,956**	530,983	2,198,078	314%	29%
Aug	60,030	462,600	1,730,570	497,323	1,449,221	191%	-34%
Sep	30,406	743,587	1,130,459	672,370			
Oct	11,613	645,487	1,062,226	704,254			
Nov	115,233	570,964	1,167,077	483,462			
Dec	188,409	352,095	1,286,594	721,439			
Total	**483,887**	**3,777,842**	**15,563,948**	**12,318,023**	**9,053,345**		
Change	1036%	681%	312%	-21%			
Change	441,299	3,293,955	11,786,106	-3,245,925			
			YTD	9,791,061	9,053,345		
			Change		-737,716	-8%	

Source: Chinese General Administration of Customs

NPI production costs are now significantly lower. Back in October 2007, industry estimates put production costs in the US$20,000-28,000/tonne (US$9-13/lb) range. CRU now estimates production costs much lower, in the US$11,000-17,000/tonne (US$5-7.75/lb) range. But it is not all clear sailing, with reports that NPI producers in China's Hebei and Shanxi provinces are cutting output due to inventory build and sluggish offtake from major steel mills. We expect NPI post 2009 to contribute at least 100,000tpa to nickel market supply.

Finished nickel production set to surge 35% by 2013F

We estimate that refined nickel supply fell by 7.5% in 2009 to 1.280mt – the lowest output in four years and the second consecutive year of supply contraction. Between end 2007 and end-2009, we estimate that world nickel supply contracted by 11%, wiping over 0.150mt off supply. Canada and Japan suffered the greatest contraction, falling 20% each over this period. The nickel price collapse brought to an abrupt halt many projects that had been years in preparation, none more so than BHPBilliton's Ravensthorpe in Western Australia, the first major nickel laterite project in production in a decade.

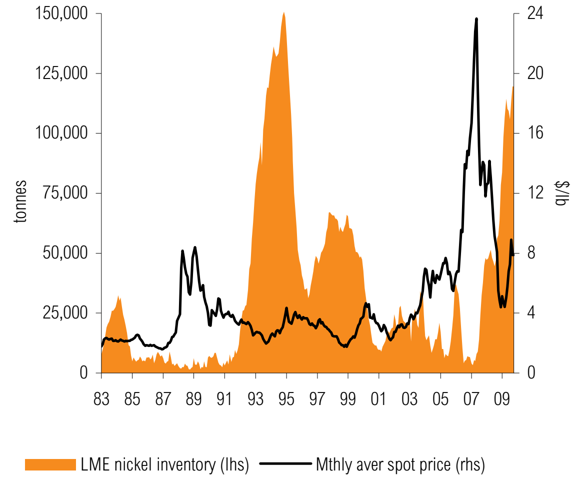
Crucially, many of these projects are merely in a state of suspended animation, awaiting a better price and demand environment. That better price environment is already under way and for 2010-13, we forecast that the nickel price will trade comfortably above the US$15,000/tonne marker and from H2 12 to be above US$20,000/tonne. Price-induced reactivations will be a strong theme. We forecast output in 2010 will rise 9% to 1.395mt and in 2011 by 6.5% to 1.485mt. By the end of 2013, we estimate 0.445mt of additional supply will have been brought onstream, representing a CAGR of 7.7% pa.

Outlook – could try harder – long slog ahead

In our view, it is now the time for nickel demand growth to ride to the rescue of the nickel market. Nickel producers have certainly done their part; no more should be asked of them. Collective cutbacks around the world resulted in over 0.300mtpa of capacity being shuttered – some of it probably permanently. At over 21%, the idled capacity was comfortably the biggest production hit that any of the base metal producers has had to endure. Nickel cutbacks have now ceased and thoughts have turned to reactivation. Our plea is that nickel producers stay their hand and do not get too encouraged by the recovery in the nickel price. Price-induced rather than demand-induced reactivation is a key threat to the challenge of eroding the hefty nickel inventory burden. Nickel producers must carefully balance the twin supply issues of reactivation and commissioning of the next generation of nickel projects that we set out earlier in this review.

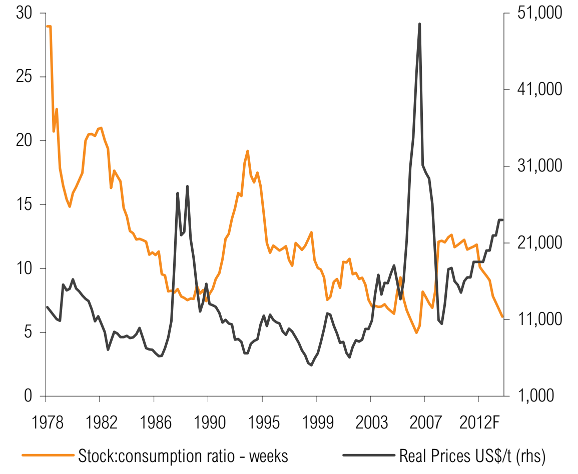
LME nickel inventories begin 4Q 09 at over 14-year highs of 0.120mt and CRU estimates that inventory build within China could be an additional and notable 0.140mt. By end-2009, we estimate that the nickel market will have been in surplus for three consecutive years, over which time a cumulative supply surplus of 0.240mt has been built. W can take comfort that price stabilisation has been achieved and indeed price progression. Spot nickel hit its cycle low in October last year at US$8,808/tonne and by August had risen 138% to US$21,000/tonne. But in our opinion, it has been a fragile price recovery, in which nickel has been swept up alongside the price rises in its sister metals. Testimony to this view is the subsequent decline of nearly 20% in the nickel price from its August highs. Premature reactivation is a real threat particularly now that Chinese nickel pig iron output has made a return to the supply side of the balance sheet.

Slump in nickel demand helped push LME warehouse stocks to the highest levels in over 14 years.



Source: LME and RBS

Nickel stock :consumption ratio and real price – a huge stock overhang with over 12 weeks of stock



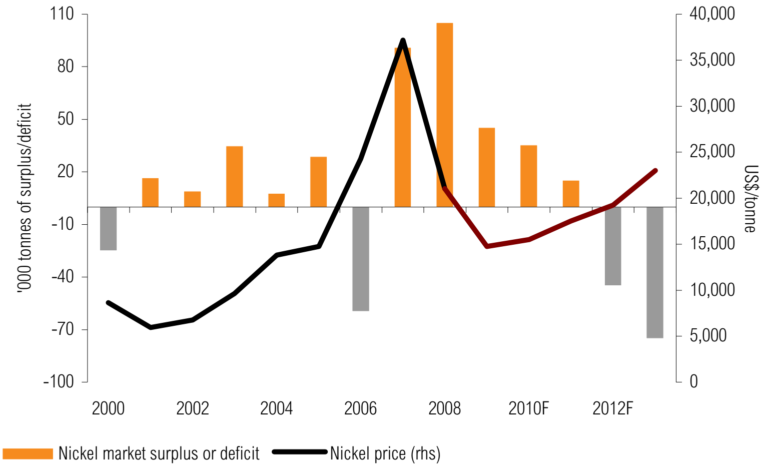
Source: LME, CRU and RBS

How great is the mess that nickel is in after the recession? We estimate that the move in reported LME, producer and consumer inventory since the demand slump began in 2007 has been 0.150mt. In terms of the stock consumption ratio, this has been on a sharply rising curve. The stock ratio ended 2006 at a critically low 5.6 weeks, providing acute pricing tension and corresponded with the record-high price. By the end of 2009, we estimate that the stock ratio will have more than doubled to over 12.5 weeks.

However, the confluence of reactivation and new capacity scheduled to come onstream is, in our view, likely to offset even our robust demand profile. As a result, we still expect the stock ratio to hover around 12 weeks through 2010-11. Indeed, we can even see the nickel price relapsing and only by 2012 getting back to consistently trading above the US$20,000/tonne marker.

Looking ahead, we view six weeks of stock as the comfort level for nickel equivalent to 0.140mt of metal. By end-2009, we forecast that the ratio will be 12.6 weeks equivalent to 0.300mt of metal. As such, before convincing pricing tension can reappear, nickel will need to erode 0.160mt of metal or nearly seven weeks of stock. That would require 25% demand growth in 2010 vs our forecast 10% growth. Put quite simply, it will take time to erode the surplus.

Cumulative nickel surplus in 2007-11F nearly 0.300mt. Watch for reactivation. By 2012F, deficits should return and better prices.



Source: CRU, LME and RBS forecasts

Since our previous review, the nickel price has performed better than we had expected. Yes, we have now halved our expected refined metal demand contraction from -6% to -3%, mainly due to the resumption of Chinese stainless demand. **However, the fundamental position for nickel in terms of the stock ratio has actually deteriorated since our April review.** LME inventory has grown by another 20,000 tonnes and unreported stocks within China have mushroomed. All provide headwinds to the price in the months ahead.

What has not changed is that we still expect diminishing supply surpluses with the market to turn to a supply shortfall in 2012 of 0.045mt, the first deficit market in five years. The real fireworks are reserved for 2013, when a 75,000 tonne supply shortfall should bring the stock ratio to six weeks with commensurately higher prices.

We have raised our 2010 spot price forecast by 17% to US$15,500/tonne (US$7.05/lb), but in a nod to what we believe is an overexuberant price, this is only 5% higher yoy from our 2009 spot average of US$14,765/tonne. We forecast annual price averages will make a more demonstrable move higher post 2011, when demand growth finally burns off supply additions and the first supply deficit in five years appears. By 2013, we can see the price reaching US$23,000/tonne (US$10.45/lb) – a gain of more than 50% on the 2009 forecast average price.

We have also had our annual look at our long term nickel price. Viewing the mix of higher cost ferro-nickel capacity, the re-entry of nickel pig iron and stronger producer currencies, we have taken the opportunity to raise our long term price (which kicks in post 2013) by 13% to US$15,000/tonne (US$6.80/lb).

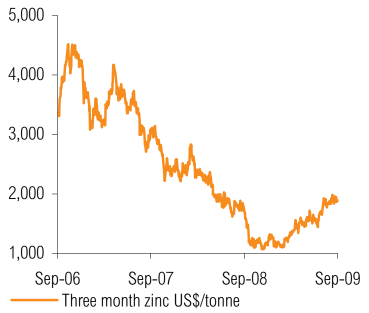
So we expect the good times to return, but first two years of heavy lifting by nickel demand should redress the supply imbalance. Were the nickel price to be stronger than we forecast, it would merely accelerate supply reactivation. As such, the period ahead is one in which demand growth cannot afford to suffer relapse.

Zinc

A middle order batsman biding its time

Zinc has trodden a middle path in this year's base metal price recovery, in line with its position in the fundamental pecking order. The market has remained in substantial underlying surplus, even if this has been mitigated by Chinese stockpiling, and we expect it to stay in surplus in 2010-11 (albeit shrinking rapidly) as producer restarts offset strong demand growth. However, the pipeline of new mine capacity is thin and we forecast that zinc will shift into hefty deficit in 2012-13, quickly eroding excess stocks. Zinc's prospects appear less enticing than those of copper and lead, and we expect the LME price to grind higher rather than lead the pack in 2010. But zinc should come to the fore thereafter and we forecast an average price in 2013 of $2,550/t. A key risk is of price escalation being brought forward as investors anticipate the tighter market.

Zinc price has recovered by c90% but remains far below its peak



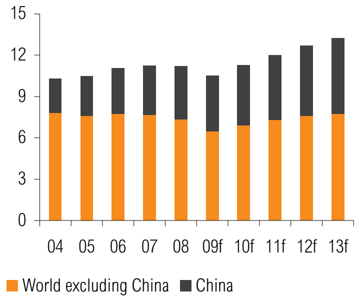
Source: LME

Demand – strong revival ahead

In our April 2009 *Commodity Companion*, we suggested world demand for zinc was then holding up better than the other big base metals and forecast that it would decline this year by 'only' 5.5%. But we did warn that the risks were on the downside and we now expect real demand to fall by 6.0-6.5% in 2009.

However, our downward revision reflects a worse-than-expected outcome in the first half, not a weaker recovery in H2. Although ILZSG figures indicate a drop of 11-12% yoy in H1, this includes growth in China of 13%, which looks unlikely to us, as discussed below. We estimate that true world demand plunged by 15% in H1. But we can now be more confident about recovery in H2, especially in Q4, when demand could bounce by up to 10% yoy as favourable base effects kick in. This sets the scene for a strong performance in 2010. Regional developments are now supportive, too. Buoyant China accounts for nearly 40% of global zinc demand, while non-Chinese demand has slumped by over 15% since 2007, due largely to ferocious destocking that is now coming to an end.

World refined zinc demand (mt), 2004-13F – may bounce 7% in 2010



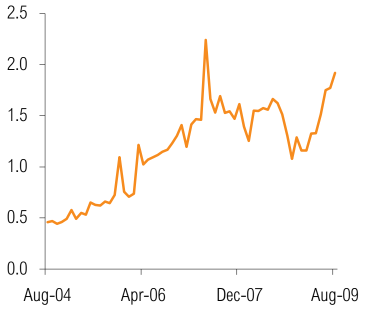
Source: CRU, ILZSG, RBS forecasts

RBS world zinc supply/demand balance, 2006-13F – surplus will shrink greatly in 2010-11, hefty deficit in 2012-13

(m tonnes)	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World zinc mine production	**10.29**	**11.17**	**11.59**	**10.95**	**11.25**	**11.60**	**12.00**	**12.45**
Change %	**4.6%**	**8.6%**	**3.7%**	**-5.5%**	**2.7%**	**3.1%**	**3.4%**	**3.7%**
of which China	2.70	3.05	2.98	2.70	2.80	2.85	3.05	3.25
Change %	16.1%	13.0%	-2.5%	-9.2%	3.7%	1.8%	7.0%	6.6%
World refined zinc production	**10.65**	**11.41**	**11.67**	**10.85**	**11.35**	**12.10**	**12.50**	**12.90**
Change %	**4.6%**	**7.3%**	**2.3%**	**-7.0%**	**4.6%**	**6.6%**	**3.3%**	**3.2%**
of which China	3.22	3.84	3.97	4.00	4.25	4.60	4.90	5.25
Change %	15.4%	19.1%	3.5%	0.8%	6.3%	8.2%	6.5%	7.1%
World refined zinc consumption	**11.04**	**11.26**	**11.21**	**10.50**	**11.25**	**12.00**	**12.70**	**13.25**
Change %	**5.2%**	**2.0%**	**-0.5%**	**-6.3%**	**7.1%**	**6.7%**	**5.8%**	**4.3%**
of which China	3.30	3.60	3.88	4.05	4.35	4.70	5.10	5.50
Change %	13.8%	9.1%	7.6%	4.5%	7.4%	8.0%	8.5%	7.8%
Implied market balance	**-0.39**	**0.15**	**0.46**	**0.35**	**0.10**	**0.10**	**-0.20**	**-0.35**
Actual reported inventory	0.55	0.63	0.83	1.05	1.25	1.45	1.30	1.00
Reported change in inventory	-0.28	0.09	0.19	0.22	0.20	0.20	-0.15	-0.30
Stock: consumption ratio (weeks)	**2.6**	**2.9**	**3.8**	**5.2**	**5.8**	**6.3**	**5.3**	**3.9**
LME spot price US$/tonne	**3,272**	**3,249**	**1,870**	**1,585**	**2,025**	**2,150**	**2,400**	**2,550**
LME spot zinc price US¢/lb	**148**	**147**	**85**	**72**	**92**	**98**	**109**	**116**
Change %	**137%**	**-1%**	**-42%**	**-15%**	**28%**	**6%**	**12%**	**6%**

Source: CRU, ILZSG, RBS estimates and forecasts

Chinese production of galvanised steel (mt) has rebounded swiftly

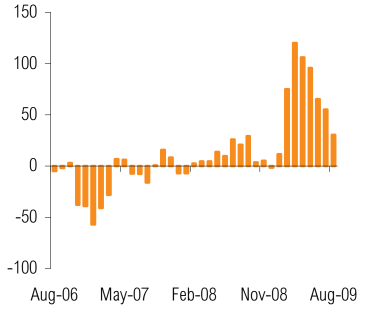


Source: Bloomberg, RBS

Zinc's first and end-use profile means it was every bit as exposed to the recent recession as other metals, but equally that it stands to benefit fairly fully from the economic revival. Some sectors may lag behind (non-residential construction) or have received a temporary boost (the car industry), but so severe was the downturn in H1 09 across all sectors that just base effects should ensure strong demand growth in 2010. Galvanised steel production (fully 50% of total zinc use) was particularly hard hit, but has already shown signs of revival, notably in China, while some areas of construction and infrastructure (together over 60% of final usage) should do well, again especially in China. All in all and including likely consumer restocking, we forecast that world zinc demand will increase by about 7% in 2010, taking it back to the peak level of 2007.

We expect demand growth to remain strong in 2011, tailing off only slowly thereafter. Our forecast CAGR between 2009 and 2013 of 6% pa may appear a stretch given that growth was less than 4% pa trough to peak between 2001 and 2007, when the world economy was booming, so we recognise that the risks are on the downside. But the trough of 2009 has been much deeper than that of 2001 and more akin to 1974-75, thus giving more potential for recovery. In any case, our forecasts have growth in China at only 8% pa compared with 15% pa in 2002-07, and non-Chinese demand not returning to its 2006 peak until 2013.

Chinese net imports of refined zinc (000t) surged in early 2009



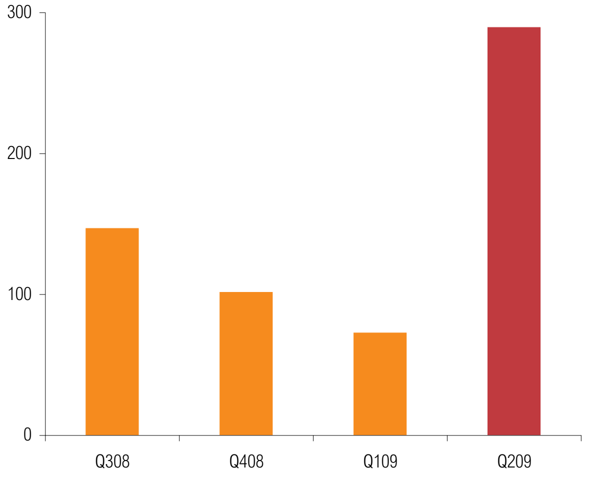
Source: Chinese General Administration of Customs, RBS

Soaring Chinese imports in H1 09 mostly went into stockpiles

Whatever the true level of world zinc demand in H1 09, apparent demand was higher, due to stockpiling activity in China. A simple calculation from domestic production, soaring net imports and changes in SHFE stocks points to growth in Chinese apparent demand in H1 09 of 17% plus. This does not look plausible as a measure of real demand. Based on our estimate that real Chinese demand fell by 3-4% yoy, we conclude that there was a buildup of refined zinc stocks in China of at least 350kt in H1 09, on top of 250kt in H2 08. The purchase of 159kt by China's State Reserves Bureau (SRB) accounted for only about 25% of all this. The rest was a combination of unconventional stockpiling involving provincial authorities, speculative hoarding by consumers, traders and others.

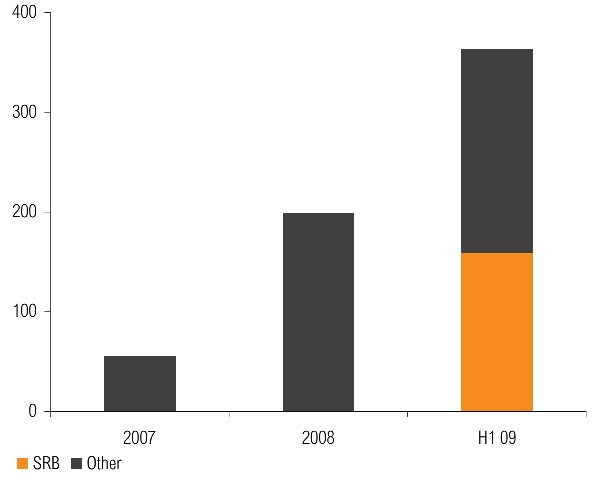
China is structurally long zinc. As such, the SRB's new zinc stockpile cannot be considered strategic in the same way as that of copper and is thus unlikely to be held for the long term. We expect large tonnages of SRB and other stockpiles to be released back into the market in the coming years. Near term, Chinese imports are likely to continue to decline from their March 2009 peak, as the LME-SHFE price differential has recently moved to make them unprofitable.

Implied build-up of unreported stocks of refined zinc in China – perhaps 600kt plus over Q3 08 to Q2 09



Source: CRU, Chinese General Administration of Customs, RBS

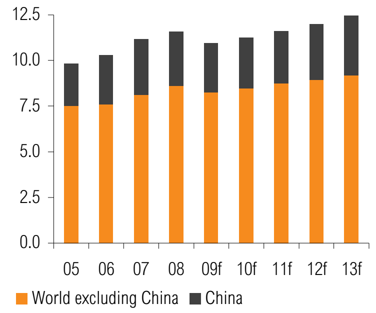
Implied build-up of unreported stocks of refined zinc in China – much in addition to SRB buying



Source: CRU, Chinese General Administration of Customs, RBS

Restarts ahead, but supply constraints loom

World zinc mine production, mt – slow recovery ahead

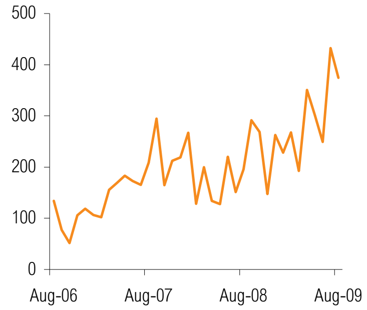


Source: CRU, ILZSG, RBS forecasts

World zinc production should not fall as heavily in 2009 as looked likely six months ago. This is principally due to restarts in the large, fragmented (and hard to monitor) Chinese mining industry as early as Q2, when the zinc price was still low. Outside China, mine cutbacks initiated between August 2008 and March 2009 amounted to an estimated 1.1mt of annual capacity (nearly 10% of global production in 2008) and the first restarts did not come until well into Q3 09, notably that of Gordonsville in the US by new owner Nyrstar. Although the zinc industry has shown uncharacteristic discipline, we expect a trickle of restarts in Q4. With first mover China accounting for 25% of the total, we forecast that world mine production will now decline by no more than 5-6% this year.

The pattern in the zinc smelting industry has been broadly similar. Chinese producers were among the first to cut back in Q4 08 but, though hard to track, it appears many were also quick to restart. The country's concentrate imports have soared to record levels this year. The lead pollution incidents have had only a small impact on the Chinese zinc smelting industry so far and have been swamped by a steady stream of new plant coming on stream. Elsewhere, cutbacks amounted to an estimated 1.2mtpa of capacity (10% of 2008 global output) at their peak, but restarts here have been greater to date than in the mining industry; at least 0.25mtpa fired up again in Q3 09, half of it in North America. We forecast that world refined zinc production will now fall by no more than 7% this year and the decline could well end up being less.

Chinese zinc concentrate imports (000t) have soared in 2009

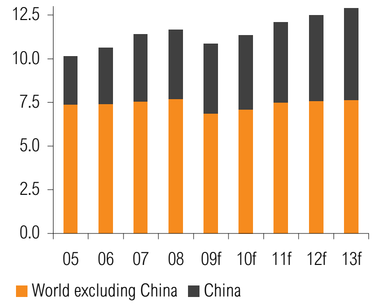


Source: Chinese General Administration of Customs, RBS

The flipside of zinc output falling less heavily in 2009 is that there should be less scope for growth in 2010-11 from the further unwinding of cutbacks. Moreover, although it seems unlikely that there will be any fresh voluntary cuts in the mining industry and almost all operations should now be comfortably cash positive, we expect some caution to be exercised. The bulk of the mine cutbacks were outright closures and **restarting is a complex business not undertaken lightly**, while a few of them remain permanent. As to capacity growth in 2010-11, there is a reasonably healthy list of new mines and expansions, but with the exception of 0.2mtpa Peñasquito in Mexico, most are small and the combined additions will be largely offset by the exhaustion of 0.25mtpa Brunswick and contraction at Antamina. We forecast that world mine production will increase by only about 6% between 2009 and 2011, albeit the risks are probably on the upside.

Beyond 2011, there may still be some additional output from straggler restarts, but much of the committed new capacity should be through the system by then, so continued mine production growth will depend greatly on as yet uncommitted projects. Although the list of these is always lengthy and the zinc mining industry has relatively short lead times and low barriers to entry, there are few really big projects for the period to 2013. We expect world mine output to rise by no more than 7-8% between 2011 and 2013, even though we forecast that prices will be very attractive by then. In all, we forecast that production will increase by only 13-14% between 2009 and 2013.

World refined zinc production, mt – a bigger bounce but not for long



Source: CRU, ILZSG, RBS forecasts

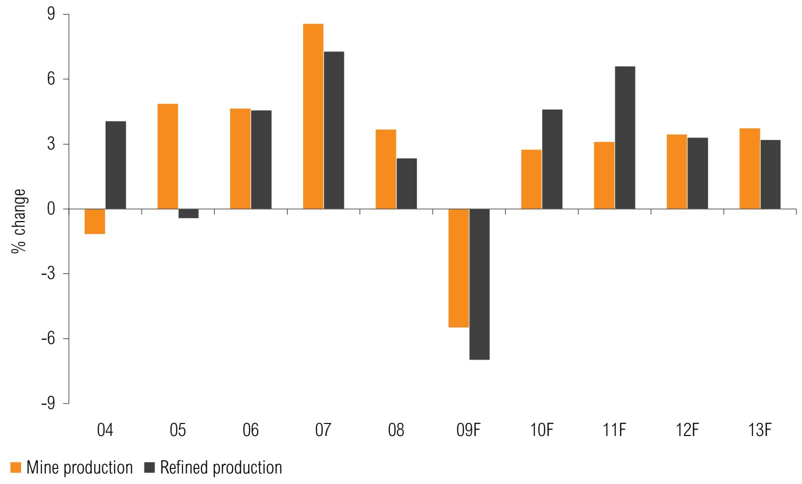
Refined production may rise rather faster over the period, first because we expect output to decline more heavily in 2009 even after growing more slowly in 2007-08, and second because processing of scrap material should increase. We certainly see few signs of a shortage of smelter capacity. That the vast bulk of capacity growth in the coming years should be in China may be seen as a source of concern, but as long as Chinese output is below domestic demand, we doubt the authorities will curb expansion materially, even with the lead pollution issues. We forecast that world refined zinc production will rise by 18-20% between 2009 and 2013, with growth skewed to 2010-11 as cutbacks continue to be unwound, after which it will be checked by tightening concentrate supply.

Selected price-related production cutbacks in the zinc industry since mid-2008; (reactivations are highlighted in red)

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Lennard Shelf, Teck/Xstrata, Australia	Implemented August 2008	Early closure of ~75kt/y mine	
Balmat, HudBay, US	Implemented August 2008	Closure of 55kt/y mine	
Hellyer, Intec, Australia	Implemented September 2008	Closure of ~25kt/y mine	
Broken Hill, Perilya, Australia	Implemented September 2008	Cut by 36kt/y from 07/08 level of 91kt	Closure of North mine but head grade up
Golden Grove/Scuddles, OZ Minerals, Australia	Announced September 2008/January 2009	To cut Golden Grove, then close Scuddles	Total cut ~75kt/y
Gordonsville et al, SRA, US	Announced October 2008	Closure, plan was to reach 60kt/y	Nyrstar gradually restarting from Q3 09
Endeavor, CBH Resources, Australia	Announced October, November 2008	To cut to ~30kt/y from plan of >60kt/y	To cut ore output by 55%, but higher grade
Mt. Garnet, Kagara Zinc, Australia	Announced October 2008	To cut 08/09 target output by 8kt to 32kt	
Caribou/Restigouche, Blue Note, Canada	Implemented November 2008	Closure of ~50kt/y operation	
Myra Falls, Breakwater Resources, Canada	Announced November 2008	Was to close ~38kt/y mine but revoked	
Langlois, Breakwater Resources, Canada	Implemented November 2008	Closure of ~38kt/y mine	
Neves-Corvo, Lundin Mining, Portugal	Implemented November 2008	Closure of zinc section, ~25kt/y	
Aljustrel, Lundin Mining, Portugal	Implemented, November 2008	Closure, was to build up to 80kt/y	
Minera Rosaura, Perubar (Glencore), Peru	Implemented November 2008	Closure of small mine	
Century, OZ Minerals, Australia	Announced November 2008	To cut 2009 production by 4%, 20kt	
McArthur River, Xstrata, Australia	Announced December 2008	To cut 2009 production by 20%, ~32kt	
East Tennessee, Glencore, US	Announced December 2008	To close 57kt/y mines in February 2009	Nyrstar bought Sept 09, to restart
Pend Oreille, TeckCominco, US	Announced December 2008	To close 31kt/y mine in February 2009	
ShalkiyaZinc, Kazakhstan	Announced December 2008	To close 25kt/y mine	
SE Missouri, Doe Run, US	Announced January 2009	To cut by ~17%, ~7kt/y	
Cerro de Pasco, Volcan, Peru	Announced January/April 2009	Closed open-pit section, cut ~40kt/y	Restarting from September 2009
Chisel North/Snow Lake, Hudbay Min., Canada	Announced January 2009	To close ~25kt/y operations	
Galmoy, Lundin, Ireland	Announced January 2009	To close ~80kt/y mine early, May 2009	
Akbastau/Belousovskoe, Kazakhmys, Kazakhstan	Announced January 2009	Closing 2 mines, production lost ~20kt/y	
Iscaycruz, Glencore, Peru	Implemented March 2009	Closure of 175kt/y mine	
Smelters			
Datteln, Ruhrzink (GEA), Germany	Announced October 2008	Closure of 135kt/y plant in December 2008	
Chelyabinsk, Russia	Announced October/December 2008	To cut production in 2009 by 60-70kt	Oct 09 announced to restore in 2010
Huludao, China	Implemented October 2008	Cut production by 27%, 105kt/y	65kt of 200kt/y and 40kt of 130kt/y
Yunnan Luoping, China	Implemented October 2008	Cut by 32% at 80kt/y plant	Full restart in July 2009
Zhuzhou, China	Implemented November 2008	Cut by 33% of 400kt/y capacity	
Hanzhong Bayi, China	Implemented November 2008	Cut by 10-20% at 120kt/y plant	
Western Mining, China	Implemented November 2008	2008 target output cut by 16kt from 70kt	
Budel, Nyrstar, Netherlands	Implemented November 2008	Cut by 28% at 260kt/y plant	Back to full production July 09
Balen, Nyrstar, Belgium	Implemented November/December 2008	Cut by 28%, then closed 275kt/y plant	To restart in Q4 09 at 70% capacity
Trail, TeckCominco, Canada	Implemented November 2008	Cut by 50-60kt/yof 310kt/y capacity	Restart full output Sept 2009
Juiz de Fora/Tres Maria, Votorantim, Brazil	Announced November 2008	Cut 12kt/y of combined capacity of 290kt/y	
Onsan, Korea Zinc, Korea	Implemented December 2008	To cut 2009 production by 10%, 45kt	
Sukpo, Young Poong, Korea	Implemented December 2008	Cut by 10%, 29kt of 285kt/y	
Kokkola/Odda, Boliden, Finland/Norway	Implemented December 2008	Cut by combined 60kt/y	Back to full production Sept 2009
Annaka, Toho Zinc, Japan	Announced December 2008/April 2009	Cut by ~20% at 137kt/y plant for Q1-Q3 09	
Clarksville, Nyrstar, US	Announced December 2008	To cut by 40%, 50kt/y of 125kt/y	Back to full production July 09
Kidd Creek, Xstrata, Canada	Implemented (but unannounced) Q1 09	Cut by ~20% at 147kt/y	
Monaca, Horsehead Corp., US	Implemented January 2009	Cut by 17% at 155kt/y plant	Restart 1 of 2 furnaces August 2009
Harima, Sumitomo, Japan	Announced January 2009	Cut by 30%, annualised 27kt	Cut through H1 09
Plovdiv, KCM, Bulgaria	Announced January 2009	To cut by ~17%, 13kt/y	
Copsa Mica, Mytilineos, Romania	Announced January 2009	To close 65kt/y smelter	
Valleyfield, Noranda IF, Canada	Announced February 2009	Cut by 20% at 280kt/y plant	Back to full production Q4 09
Balkhash, Kazakhmys, Kazakhstan	Implemented March 2009	Closed 80kt/y plant	Production usually ~50kt/y
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 45kt/y plant	Due to financial/environmental problems
Iijima, Dowa, Japan	Announced April 2009	Cut by 28% in H1 09/10 at 203kt/y plant	
Hachinohe/Hikoshima/Kamioka, Mitsui, Japan	Announced April 2009	Cut by 5% yoy in H1 09/10	Combined capacity 267kt/y

Source: Company reports, Reuters, Bloomberg, RBS

World mine and refined zinc production, 2004-13F, yoy % change – refined output to recover faster but then constrained by tighter concentrate supply



Source: CRU, ILZSG, RBS forecasts

We expect China to account for about 60% of world refined zinc production growth in 2010-13, which would take its market share to at least 40% by the end of the period. But as stated above, we do not expect the country to return to having an exportable surplus of metal; on the contrary, there may be a growing deficit. However, China's actual trade in refined zinc may follow a slightly different path as the large stocks that have built up in the last year or so are released to the market. The country may even return to being an occasional net exporter if the LME-SHFE price differential adjusts to make shipments profitable.

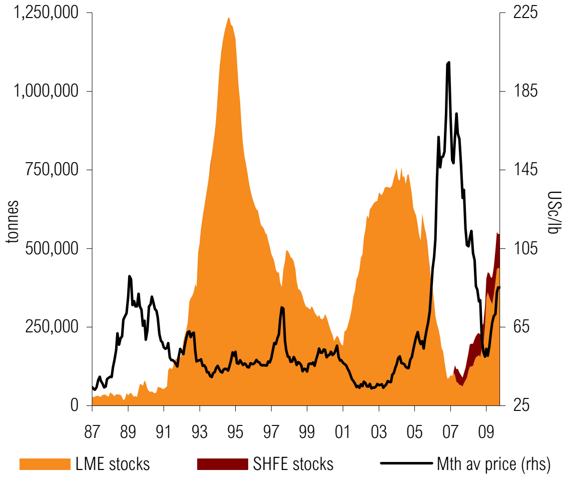
Outlook – should come into its own in 2012-13

Zinc's prospects over the coming year or so depend partly on what happens to the unconventional inventories that we are convinced have accumulated since 2006 and especially since mid-2008. We estimate an underlying global surplus over 2007-08 of 0.60mt and forecast a further surplus of 0.35mt in 2009. Yet reported producer, consumer, merchant and exchange stocks have to date risen by less than 0.55mt since end-2006. We believe the difference is more than fully accounted for by a big buildup of unconventional inventories in China over the past few quarters. We suspect much of this material will trickle out at least into the Chinese market in the coming years. Moreover, at the same time, we forecast that the global zinc market will remain in underlying surplus in 2010-11 (albeit rapidly shrinking) as production restarts offset strong demand growth.

If our supply/demand forecasts prove close to the mark and if metal does move out of Chinese stockpiles, then reported inventories could escalate to over six weeks of world demand in 2011, similar to 2002-03 and up from little more than 2.5 weeks at the end of 2006. It might be concluded from this that the LME zinc price will retreat over the next 12-18 months following its near doubling from the trough of December 2008. But it should be noted that the price is still less than half its peak of late 2006 (even in US dollars) and that it has recovered far less in key producer currencies.

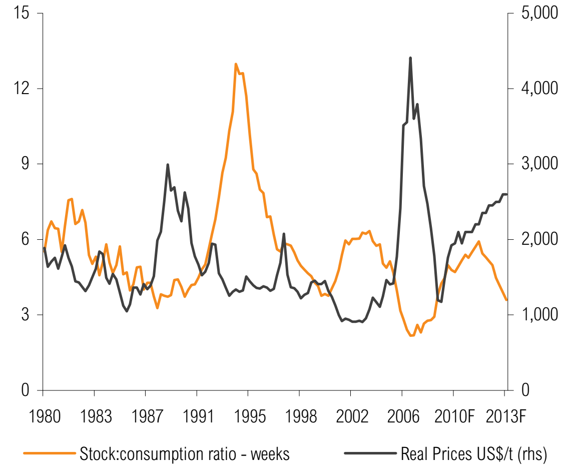
More importantly, we believe that after restarts are through the system, the lean pipeline of new mine capacity means the zinc market will shift into hefty deficit in 2012-13, quickly eroding excess stocks. We expect the market and investors to focus more on this longer-term picture.

Exchange zinc stocks and spot zinc price – still not especially high by historical standards



Source: LME, SHFE, RBS

Zinc stock :consumption ratio and real price – inventory cover to decline sharply in 2012-13



Source: LME, ILZSG, CRU, RBS forecasts

Zinc's fundamental prospects are not as compelling as those of copper and lead, but this is already partly reflected in relative price performance and zinc does look structurally sounder than aluminium and nickel. We do not expect zinc to become a leading light as soon as 2010; rather, we expect it to continue to hide its light under a bushel, with the LME price grinding higher. But it should come into its own in 2012-13.

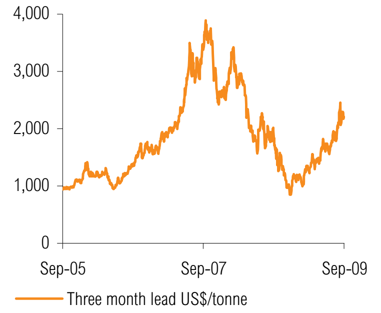
We have raised our forecast of the long-term average zinc price by about 15% to $1,800/t. This is partly on adverse currency considerations, not only the recent weakening of the US dollar but also the strengthening of key producer currencies, notably the Australian and Canadian dollars. Given, too, the substantial deficit we expect in 2012-13 and potentially beyond, it seems likely that a higher price will be needed to entice onstream enough new mines to balance the zinc market over the longer term.

We have not greatly changed our price projections for 2011-12, but now forecast an average LME price in 2013 of US$2,550/t, up about 60% from that for 2009. Without wishing to dismiss the clear downside risks, we think the biggest risk to our forecast profile is of price escalation being brought forward as investors anticipate much tighter market conditions by 2013.

Lead

Destined for even greater glory

Lead price nearly triples at best, recoups half previous losses

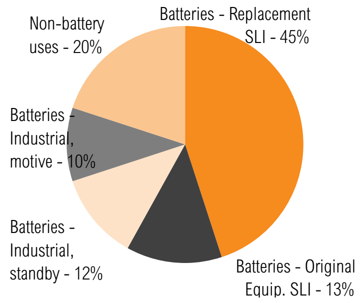


Source: LME

Even after its excellent price recovery of the past nine months, we believe the medium-term outlook for lead remains very bullish and it is one of our top metal picks. Lead demand has held up well through the recession and whilst its cyclical recovery should be relatively muted, underlying trends appear firm. Secondary production cannot on its own satisfy all the additional demand through the cycle. Meanwhile, the primary sector remains hampered by lead's by-product status in most of the mining industry. Although reported stocks may continue to tick up over the next 6-12 months, we expect them to remain historically low and forecast that the market will return to deficit in 2011-13, leaving it at least as tight as in 2006-07. The absolute price peak of the last bull market may be out of reach, but we forecast that after consolidation in 2010, the annual average LME price will hit a new record high in 2013 of US$2,750/t.

Demand – less cyclical, but firm underlying trend

Estimated world lead demand by end use – less cyclical



Source: Brook Hunt, RBS

World lead demand has not held up quite as well this year as we had expected, but with a decline that we now forecast at 2.5-3.0%, it should still have been more resilient than other base metals. The ILZSG estimates that demand actually rose by 2.5% yoy in H1 09, but this includes growth in China of fully 35%, which to us looks highly unlikely, of which more below. We expect Chinese growth to slow to about 6% this year, with demand elsewhere falling by as much as 8%.

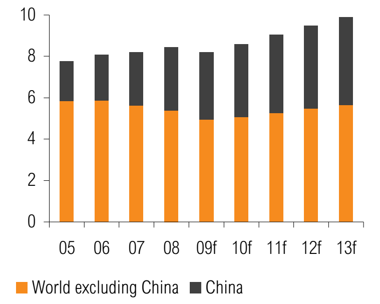
Lead's resilient, if slightly disappointing, record is illustrated by North American automotive battery shipments. Original equipment (OE) units collapsed by 39% yoy in Jan-July, but the far bigger and largely (yet clearly not wholly) recession-proof replacement sector shrank by 2%, leaving the combined total down 8%. The OE sector has fared less badly elsewhere, but we expect global light vehicle sales to fall by 10% this year. With industrial batteries and non-battery use poor, too, replacement batteries may account for 45% of total lead demand in 2009.

RBS world lead supply-demand balance, 2006-13F; return to deficit by 2011, severe tightness by 2013

(m tonnes)	2006	2007	2008	2009F	2010F	2011F	2012F	2013F
World lead mine production	**3.60**	**3.67**	**3.84**	**3.75**	**3.90**	**4.05**	**4.25**	**4.40**
Change %	1.3%	2.0%	4.4%	-2.2%	4.0%	3.8%	4.9%	3.5%
World primary refined production	**3.61**	**3.59**	**3.83**	**3.55**	**3.75**	**3.95**	**4.13**	**4.33**
World secondary refined production	**4.31**	**4.54**	**4.78**	**4.70**	**4.85**	**5.05**	**5.25**	**5.50**
World refined lead production (incl. US DNSC sales)	**7.93**	**8.12**	**8.61**	**8.25**	**8.60**	**9.00**	**9.38**	**9.83**
Change %	**3.5%**	**2.5%**	**6.0%**	**-4.1%**	**4.2%**	**4.7%**	**4.2%**	**4.8%**
of which China	2.72	2.79	3.15	3.20	3.35	3.65	3.90	4.20
Change %	13.6%	2.7%	13.0%	1.6%	4.7%	9.0%	6.8%	7.7%
World refined lead consumption	**8.09**	**8.21**	**8.43**	**8.20**	**8.60**	**9.05**	**9.48**	**9.90**
Change %	**4.1%**	**1.5%**	**2.7%**	**-2.7%**	**4.9%**	**5.2%**	**4.7%**	**4.5%**
of which China	2.21	2.57	3.06	3.25	3.53	3.78	4.00	4.25
Change %	15.1%	16.3%	19.0%	6.2%	8.6%	7.1%	5.8%	6.3%
Implied market balance	**-0.16**	**-0.09**	**0.18**	**0.05**	**0.00**	**-0.05**	**-0.10**	**-0.08**
Actual reported inventory	0.27	0.27	0.31	0.40	0.45	0.40	0.35	0.30
Reported change in inventory	-0.02	-0.00	0.04	0.09	0.05	-0.05	-0.05	-0.05
Stock: consumption ratio (weeks)	**1.7**	**1.7**	**1.9**	**2.5**	**2.7**	**2.3**	**1.9**	**1.6**
LME spot price US$/tonne	**1,287**	**2,594**	**2,084**	**1,700**	**2,250**	**2,400**	**2,525**	**2,750**
LME spot price USc/lb	**58**	**118**	**95**	**77**	**102**	**109**	**115**	**125**
Change %	**32%**	**102%**	**-20%**	**-18%**	**32%**	**7%**	**5%**	**9%**

Source: CRU, ILZSG, RBS estimates and forecasts

World refined lead demand (mt), 2005-13F – solid trend growth

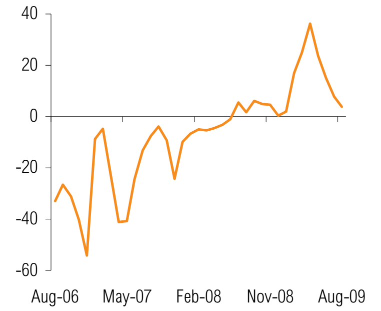


Source: CRU, RBS forecasts

The corollary of lead's resilience this year is that the cyclical rebound in demand in 2010 is likely to be less pronounced than that for other metals. Replacement automotive battery demand may grow only slightly faster than in 2009. Moreover, RBS forecasts that world vehicle sales will recover by only 3% next year, the real bounce coming in 2011, while industrial batteries tend to track later-cycle capital spending. Yet lead should, like other metals, benefit from healthy restocking after the ravages of this year, and buoyant China's market share is now fully 40%. We expect world lead demand to rise by nearly 5% in 2010.

Lead's CAGR between 2001 and 2007 was close to 4% pa, in line with copper and zinc, and a considerable improvement on previous cycles. Much of the zest came from the explosive growth of the electric bicycle market in China and it is hard to see this being matched in the coming years. But from a deeper trough and with China's market share far higher than in 2001, we believe that global lead demand growth from 2009 to 2013 could average closer to 5% pa.

China became a big net importer of refined lead in H1 09 (000t)



Source: Chinese General Administration of Customs, RBS

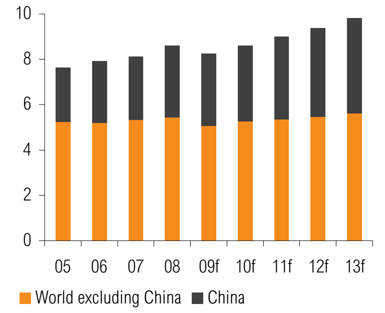
China appears to have stockpiled some lead in H2 08 and H1 09

We estimate that real world lead demand fell by 4.5-5.0% yoy in H1 09, but apparent demand was firmer due to stockpiling activity in China. A simple calculation from domestic production and surging net imports points to growth in Chinese apparent demand in H1 09 of 13% yoy based on our output estimates (and much more on NBS and ILZSG figures). This does not look plausible as a measure of real demand. Based on our estimate that real Chinese demand rose by only 6%, we conclude that there was a build-up of refined lead stocks in China of over 100kt in H1 09, on top of a little less in H2 08.

In the case of lead, none of the material was bought by the State Reserves Bureau, but provincial authorities may have been involved and there may also have been more speculative hoarding by consumers, traders and others. We expect much of the material to trickle back into the market in the coming years, but crucially, as we explain later in this review, we do not expect China to return to being a major net exporter of lead to the west.

Supply − constraints will soon re-emerge

World refined lead production (mt) – China's share already nearly 40%

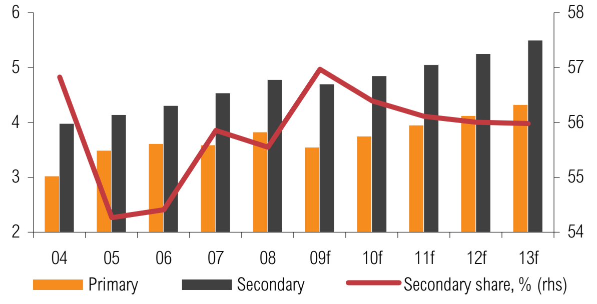


Source: CRU, ILZSG, RBS forecasts

Just as demand has fallen short of our earlier expectations, so we now forecast a larger decline in world lead production in 2009. Developments this year have also exposed a key vulnerability of the supply side of the lead market, namely its heavy dependence on the massive Chinese smelting industry. Already last year China accounted for 37% of total refined production and fully 60% of primary output, and both shares will be even higher in 2009. So it is no surprise that the lead price spiked in Q3 on news that **pollution incidents had forced the closure of several smelters with combined capacity of at least 0.275mtpa**, and on fears of more to come as the authorities intensify environmental surveillance. The current situation is uncertain, but we doubt that the ultimate impact on Chinese production will be huge. Some plants may shut permanently but there is ample spare capacity and new, cleaner smelters are coming onstream all the time. Nevertheless, there are clear risks in over-reliance on the Chinese industry.

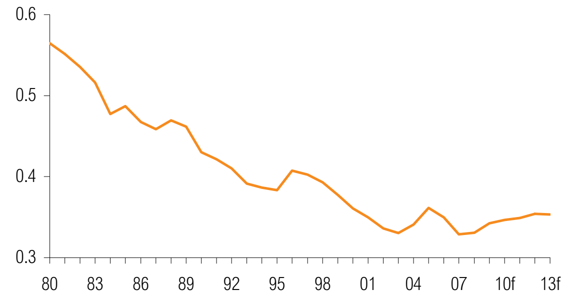
We now forecast that total world refined lead production will fall by 4% in 2009. Even normally steadily rising secondary output may dip due to slower growth in China, the closure of a few plants elsewhere and the reduced availability of scrap batteries earlier in the year. But even so, we expect the secondary sector to account for a record 57% of total production in 2009. This high share is significant because the secondary sector has limited sensitivity to the lead price. As the bulk of scrap is generated from spent vehicle batteries, the collection of which is mandatory by law in many countries, the pool will continue to expand, but only broadly in line with past growth in the global vehicle population. The annual growth rate here is slower than the rate of growth in lead demand we expect in 2010-13, and the gap can only partly be bridged by further improvement in collection and recycling rates. We forecast that world secondary lead production will increase by at most 4% pa.

World refined lead production, 2004-13F (mt) – growth to be constrained by raw material inflexibilities



Source: CRU, ILZSG, RBS forecasts

World mine production of lead per tonne of zinc – has at least stabilised after remorseless decline



Source: CRU, ILZSG, RBS forecasts

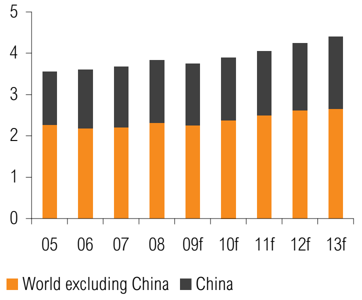
The above means the burden of meeting growing demand will fall heavily on the primary sector. Yet not only is this industry smaller, but also lead is usually only a co- or byproduct of zinc at mines, which results in market rigidity. This said, it has been clear for some months that lead mine output will not fall as heavily in 2009 as that of zinc, and yet that there is ample potential for recovery in 2010.

The price-induced cutbacks and closures were mostly at mines that produce less lead per tonne of zinc than the industry average and several of the zinc mines that shut produce no lead at all. We estimate that outside China the lead mine cuts and closures instituted between August 2008 and March 2009 amounted to only about 0.220mtpa of annual capacity, or less than 6% of 2008 world production compared with 10% in the case of zinc. Few of these cuts have yet been reversed, but it appears that restarts in the disproportionately large (and hard to track) Chinese industry were already under way in Q2 09. We now expect world lead mine output to decline by only about 2% this year.

At first sight this might suggest less scope for growth next year than in the case of zinc. However, on top of the likely reactivation of most of the capacity closed in 2008-09, lead-only Magellan in Australia (up to 100ktpa and shut for entirely different reasons in 2007) now looks set to reopen, while the few new mines include lead-rich Peñasquito in Mexico (also of the order of 100ktpa). We forecast that global lead mine production will rise by 4% in 2010.

Primary refined production is following a slightly different path. Even excluding China (but including La Oroya in Peru), market-driven lead smelter cutbacks came to about 0.275mtpa and although some of the hefty cuts in China have been unwound, they have been offset by the pollution related closures. We judge that world output could drop by at least 7% in 2009. But this leaves scope for a stronger recovery than at the mine level in 2010-11. There will certainly be no shortage of capacity, and especially if the problems at La Oroya are resolved. Our forecast is that global primary refined lead output will bounce by 5-6% in 2010, although a more pedestrian performance by the bigger secondary sector may confine overall production growth closer to 4%.

World lead mine production, mt – limited swing then limited growth



Source: CRU, ILZSG, RBS forecasts

Selected price-related production cutbacks in the lead industry since mid-2008; (reactivations are highlighted in red)

Plant, company, country	Date announced/implemented	Annualised tonnage cut	Notes
Mines			
Lennard Shelf, Teck/Xstrata, Australia	Implemented August 2008	Early closure of ~20kt/y mine	
Hellyer, Intec, Australia	Implemented September 2008	Closure of ~15kt/y mine	
Broken Hill, Perilya, Australia	Implemented September 2008	Cut by 2kt/y from 07/08 level of 52kt	Closure of North mine but head grade up
Golden Grove/Scuddles, OZ Minerals, Australia	Announced September 2008/January 2009	To cut Golden Grove, then close Scuddles	Total cut ~5kt/y
Endeavor, CBH Resources, Australia	Announced October, November 2008	To cut to ~15kt/y from plan of >30kt/y	Cut ore output by 55%, but higher grade
Caribou/Restigouche, Blue Note, Canada	Implemented November 2008	Closure of ~20kt/y operation	
Aljustrel, Lundin Mining, Portugal	Implemented, November 2008	Closure, was to build up to 18kt/y	
Century, OZ Minerals, Australia	Announced November 2008	To cut 2009 production by 4%, ~2kt	
McArthur River, Xstrata, Australia	Announced December 2008	To cut 2009 production by 20%, ~7kt	
Pend Oreille, TeckCominco, US	Announced December 2008	To close 5kt/y mine in February 2009	
ShalkiyaZinc, Kazakhstan	Announced December 2008	To close 18kt/y mine	
SE Missouri, Doe Run, US	Announced January 2009	To cut by ~17%, ~38kt/y	
Cerro de Pasco, Volcan, Peru	Announced January/April 2009	Closed open-pit section, cut ~20kt/y	Restarting from September 2009
Galmoy, Lundin, Ireland	Announced January 2009	To close ~20kt/y mine early, May 2009	
Iscaycruz, Glencore, Peru	Implemented March 2009	Closure of 15kt/y mine	
Smelters/refineries			
Anyang Yubei, China	Implemented July 2008	Cut by ~30kt/y for seven months	Back at full production Feb 09
Zhen Xing, China	Implemented August 2008	Cut by ~30kt/y	Mainly due to concentrate shortage
Huludao, China	Implemented October 2008	Cut by ~10kt/y at ISF plant	
Yuguang Gold, China	Implemented November 2008	Closed 100kt/y plant	
Herculaneum, Doe Run, US	Implemented November 2008	Cut by about 18kt/y 12-13% of capacity	
Xinling Refining, China	Implemented November/December 2008	Cut by 60kt/y, then shut100kt/y plant	Restarted at 50% Feb. 09, 75% April
Chigirishima, Toho Zinc, Japan	Announced December 2008/March 2009	Cut by annualised ~21kt/y for Q1-Q2 09	
Harima, Sumitomo, Japan	Announced January 2009	Cut by ~15%, annualised ~5kt	Cut through H1 09
Plovdiv, KCM, Bulgaria	Announced January 2009	To cut by ~12%, 8kt/y	
Copsa Mica, Mytilineos, Romania	Announced January 2009	To close 22kt/y smelter	
La Oroya, Doe Run, Peru	Implemented March/June 2009	Forced to cut then close 120kt/y plant	Due to financial/environmental problems
Baton Rouge, Exide, US	Announced March 2009	To close 60kt/y secondary plant	Has been producing at only ~30kt/y
Portovesme, Glencore, Italy	Announced June 2009	Temporarily closed 80kt/y plant	

Source: Company reports, Reuters, Bloomberg, RBS

The situation should, however, begin to change post 2010. The key sources of mine production growth next year should continue to contribute in 2011, but they should be countered by the exhaustion of 70ktpa Brunswick in Canada in late 2010. The pipeline of committed new lead-producing mines and expansions for 2011-13 is thin and the list of uncommitted projects standing a realistic stance of coming onstream in the period is short. We forecast that world lead mine output will increase by an average of about 4% pa between 2010 and 2013, but growth may tail off at the end of the period and the risks are on the downside. Coupling this with trends in the secondary sector, we conclude that growth in overall refined lead production between 2009 and 2013 will be 4.5% pa at most.

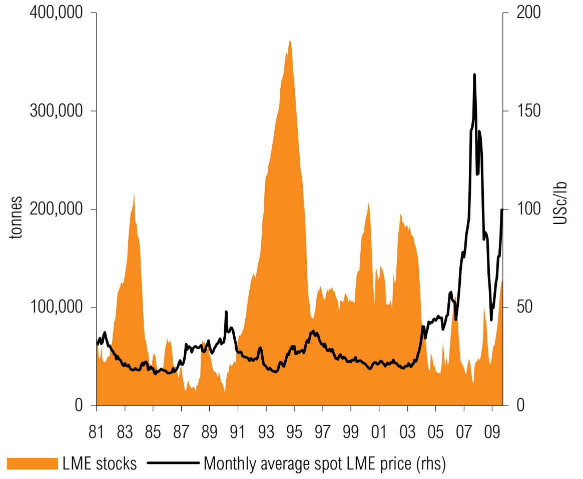
One new primary smelter is due to be commissioned in each of Brazil and India and there should be more widespread, smaller capacity increments in the secondary sector. But looking ahead, most of the increase in world refined lead production will have to come from China. Capacity there is already ample and more is planned, so the question is how much the authorities will allow to be produced. They may well force the pace of already planned permanent closures of old, dirty plants and add others to the list, but our judgment is that they will permit domestic production to continue to grow at a solid pace as long as the country does not thereby return to having a big exportable surplus. If so, it is likely that China's share of global production will soon rise above 40%. This must be of some concern, especially in light of recent events.

Outlook – return to severe tightness by 2013

We believe the lead market faces the prospect of returning to the fundamental tightness of 2006-07 by 2013. It is no longer the slow-growing market of past decades, even if demand for lead is less cyclical than that for other metals. Secondary production cannot on its own satisfy all the additional demand through the cycle and the primary sector remains hampered by lead's by- or at best co-product status in most of the mining industry. It is hard to see mining companies collectively retooling to prioritise lead any time soon. We forecast a cumulative underlying deficit in 2011-13 of at least 0.225mt, which may take the reported stocks to consumption ratio down towards just 1.5 weeks.

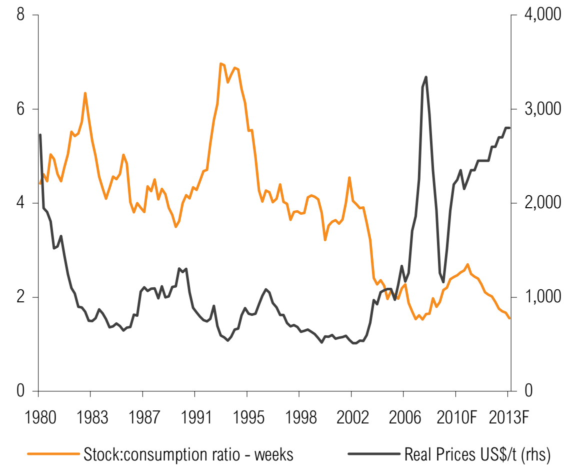
As to the shorter-term future, reported stocks may continue to tick up over the next 6-12 months, especially if the unreported inventory that we believe built up in 2008 and H1 09 (mainly in China) begins to trickle back into the market. But despite the sharp rise on the LME this year, overall reported inventories remain historically low and we do not expect the stock: consumption ratio to escalate even to the levels of 2002 before it starts to decline steadily. For lead, the transition year to supply deficit is 2010, in our view, sooner than for most metals.

LME lead inventories and spot lead price – stocks up sharply but still historically low



Source: LME, RBS

Lead stock:consumption ratio and real price – ratio to fall back sharply, price to rocket further



Source: LME, ILZSG, CRU, RBS forecasts

Even after its impressive recovery this year, we believe the outlook for the lead price remains bullish. The recent brief spike to about $2,500/t may be just a taster of what is to come. Although the absolute peak of the last bull market (near $4,000/t) may be out of reach, we forecast that the annual average LME cash price will hit a new record high in 2013 of US$2,750/t, eclipsing that of 2007. There may be a period of correction in 2010 (even though we expect it to be the year in which the mean price records its largest yoy gain this cycle). But we believe the biggest risk to our forecast profile is that price escalation will be brought forward as investors anticipate severe market tightness.

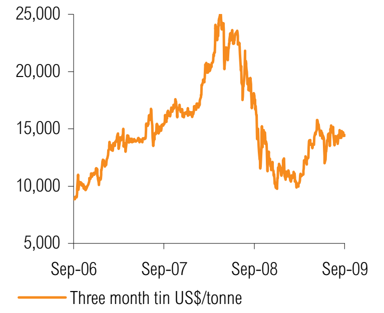
In addition to substantial upward revisions to our short-to-medium term price projections, we have raised our long-term average price forecast by fully 30% to US$1,700/t. This reflects our belief that with demand trends firm and the secondary sector able to contribute only so much, greatly increased investment in the lead mining industry will be needed if the market is to reach a sustainable balance. Our upgrade also reflects the recent weakening of the US dollar and the strengthening of key producer currencies, notably the Australian dollar.

Tin

This laggard should begin to catch up in 2010

Tin has had its fair share of drama in the shape of a large and persistent backwardation, but it has lagged behind in this year's base metal price recovery. This partly reflects its relatively high starting point and perhaps the fact that it is not a constituent of the main commodity indices. We forecast a sizeable surplus for 2009, but no larger proportionately than elsewhere and concentrated in H1. After three poor years, the cyclical recovery in demand next year should be as strong as most and although production has stabilised, we forecast that it will barely keep up. Thereafter, the tin industry has supply-side constraints similar to other metals, and growing market tightness is expected. After what could be a volatile Q4 09, we forecast that tin will begin to catch up next year, establishing itself above US$15,000/t and eventually heading towards the 2008 average.

Tin has had its own drama, but its price recovery has lagged behind

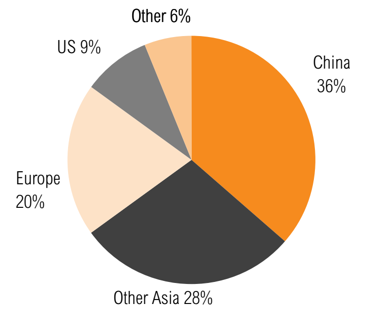


Source: LME

Demand to recover strongly after three poor years

We have raised both our estimate of world tin demand in 2008 and our forecast for 2009. Nevertheless, it appears that offtake fell 7-8% between 2006 and 2008 and that the total last year was barely higher than in 2005, before the final push by consumers to meet impending EU regulations curtailing the use of lead-containing solder. Furthermore, demand may have plunged by up to 20% yoy in H1 09 to its lowest first-half total since 2002 or even 2001. It is important to note, however, that we are referring to *apparent* demand, and it is clear that the collapse since 2006, and especially in Q4 08 and H1 09, involved massive consumer destocking. We believe this has now run its course.

World tin demand by region (2008) – dominated by Asia



Source: CRU, WBMS, RBS

Solder, which accounts for over 50% of tin demand, has been at the forefront of recent developments, both the destocking and the weakness of actual usage. But equally it should lead the recovery, particularly with Asia dominating offtake. Tinplate (17%) is far less cyclical and so has held up better, while chemicals demand (15%) has been supported by new uses, but both may be slower to pick up. We expect the end of destocking finally to return global demand to growth in H2 09, especially in Q4 09, and forecast that over the full year it will fall by 'only' 6-7%. Yet that would still leave tin demand down 13-14% since 2006, at its lowest since 2003, and this from a metal with a solid set of uses. The yoy comparison should be very favourable early next year, and we forecast demand growth of 8% in 2010.

RBS world tin market supply-demand balance, 2006-10F

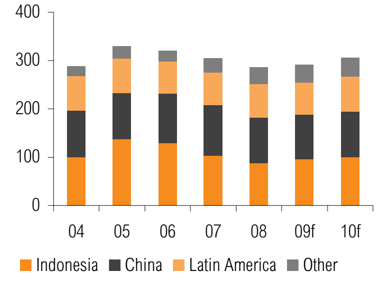
000 tonnes	2006	2007	2008	2009F	2010F
World mine production	318	304	284	290	305
World refined production	**356**	**347**	**327**	**325**	**340**
Change, %	2.3%	-2.5%	-5.8%	-0.6%	4.6%
US DNSC stockpile sales	9	8	4	0	0
World refined consumption	**364**	**356**	**337**	**315**	**340**
Change, %	**9.3%**	**-2.2%**	**-5.3%**	**-6.5%**	**7.9%**
Implied market balance	**1**	**-1**	**-6**	**10**	**0**
Change in reported stocks	-3	0	-3	13	5
Reported stocks	36	35	32	45	50
Stock: consumption ratio, weeks	**5.1**	**5.2**	**5.0**	**7.4**	**7.6**
LME cash price, US$/tonne	**8,755**	**14,526**	**18,487**	**13,775**	**16,000**
LME cash price, US$/lb	**3.97**	**6.59**	**8.39**	**6.25**	**7.25**
Change, %	19%	66%	27%	-25%	16%

Source: CRU, ITRI, WBMS, RBS estimates and forecasts

Supply has stabilised, but limited growth ahead

Tin production may well come in rather higher this year than seemed likely a few months ago. As ever, much depends on the Indonesian industry, which even last year still accounted for 30% of world mine output, but which remains chaotic and difficult to monitor. Despite earlier cutbacks, the tonnage checked for export rose by 9% yoy in H1 09, while the Indonesian government has continued to issue new export licences and has still not decided on any national production cap. But there has recently been a renewed police crackdown on illegal mining. Although this has ratcheted up uncertainty, we now expect Indonesian tin mine output to recover rather than contract further this year, by up to 10%.

World tin mine output by major country/region, 2004-10F (000t)



Source: CRU, WBMS, RBS forecasts

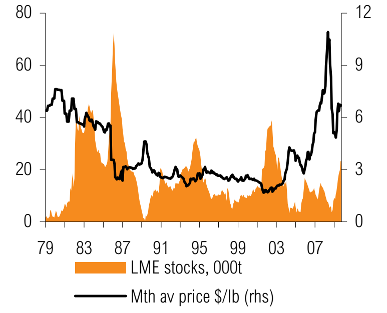
Elsewhere, although there appears to have been a setback to the rejuvenation of the Brazilian industry, Chinese mine production appears likely to hold up despite earlier cutbacks, and Australia remains on track to raise output by about 5kt. Overall, we now forecast that world tin mine output will turn back up by a modest 2% in 2009. The persistent tightness of concentrate supply means, however, that refined production may be flat at best, albeit the total here too will be higher than seemed probable a few months ago. Official data show a huge jump in Chinese output in mid-2009, both mom and yoy, but even after allowing for the rescinding of earlier cutbacks, this is difficult to explain. The figures may include re-refining activity and perhaps inventory releases from the stockpiling of Q1 09.

Whilst tin has lagged behind in the commodity price recovery this year, the gains made so far, plus the further progress we forecast for the coming months, should prompt a more material increase in world tin mine production next year. This will come through both capacity increments, notably in Argentina (Pirquitas) and Australia, and a full year without market-induced cutbacks (China/Indonesia). But the precise rate of growth will depend greatly on developments in unpredictable Indonesia. We forecast a rate of about 5%, but even though this would leave output still shy of the peak of 2005, the risks are skewed to the downside. The same is true of our similar forecast for global refined production, even though the recycling sector should contribute to growth. Beyond 2010 it is more difficult to see where production growth will come from given the dearth of new projects.

Period of surplus ending, supply constraints loom

Although we now calculate that despite sliding demand the global tin market recorded a non-negligible deficit in 2008, we forecast a sizeable underlying surplus of 10,000t this year. There is certainly a risk that production will fall short of our projection, but, equally, demand may not recover as strongly in H2 09 as we have assumed. Nevertheless, following the hefty surplus of H1, we expect the market to be in broad underlying balance in H2, even though LME stocks have continued to rise to a six-year high of over 25,000t. Metal has been attracted by the large backwardation, perhaps from unreported inventory that has built up in recent years. Such material may continue to resurface into 2010, but we forecast that tin output will barely keep up with improving demand next year and that the dearth of new mines will lead to growing market tightness from 2011.

LME tin stocks up sharply, but still not high by historical standards



Source: LME

That tin's price recovery still lags behind those of most base metals is not surprising given the much higher starting point relative to past lows. Another factor may be that tin is not a constituent of the key commodity indices. Yet tin's fundamentals have not been markedly worse than most this year, and we believe it should experience an equally strong cyclical recovery in demand in 2010. Although trend demand growth is unlikely to return to the rate of 2003-06, tin has similar latent supply-side constraints. After what could be a volatile Q4 09, we expect tin to begin to catch up next year, with the LME price establishing itself above US$15,000/t and eventually heading towards the 2008 average.

Gold

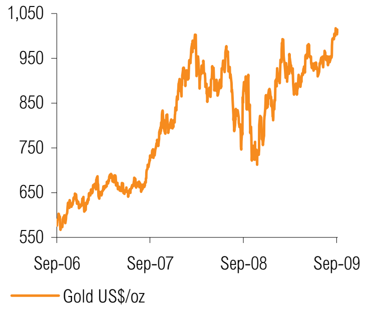
Agnostics become believers – well done gold!

Uniquely among the base and precious metals, the gold price in US dollars will in 2009 **have achieved eight consecutive years in which the annual average price has been higher than that of the previous year**. Indeed, our forecast of US$950/oz for gold has not changed since our 14 January 2009 *Commodity Companion – Metamorphosis*. I like to divide gold watchers into three groups: gold atheists (non-believers), agnostics and, of course, disciples. Alas, the gold atheists are well dug in. My plea to them is that at the very least investment in gold should not be a matter of belief, but a matter of inquiry!

The good news is that the past eight years of consecutive higher annual prices has done wonders in converting the agnostics. As they say “the proof of the pudding is in the eating”. Over this time we have seen the arrival of a family of physically backed ETFs (11 and counting) to feed the voracious appetite for exposure to gold in addition to traditional investment in gold mining shares.

While the worst of the banking problems are now deemed to be over, the gold price has continued to rise as investors now turn their attention to the prospect of other risks, particularly the fallout from fiscal imbalances resulting in incipient inflation and the potential for further dollar devaluation. These concerns were underscored in September 2009 by the G20 finance ministers’ meeting, at which there was an agreement that exit strategies would be “cooperative and coordinated,” but also likely to vary across countries.

Gold, back to record highs in US$ terms, but not in other currencies



Source: LBMA

Uncertainty

This raised further uncertainty in that it suggested that different governments would act at different times and paces according to their individual economic conditions, thus raising the likelihood of interest rate, exchange rate and bond yield differentials developing. The lack of predictability of such changes encourages gold investment by virtue of gold’s very low or negative correlation with the vast majority of asset classes, which helps to reduce volatility in a portfolio and expands the efficient frontier.

RBS world gold market supply demand balance 2005-12F – prepare for US$1,000/0z average in 2010

Tonnes	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**
Mine production	2,550	2,485	2,478	2,414	2,502	2,600	2,630	2,670
Change, %	*2.2%*	*-2.5%*	*-0.3%*	*-2.6%*	*3.6%*	*3.9%*	*1.2%*	*1.5%*
Net Official Sector sales	663	365	484	236	16	250	250	250
Old Gold Scrap	898	1,129	958	1,209	1,485	1,200	1,000	850
Producer hedging	-92	-410	-444	-351	-160	-170	-50	-30
Total Supply	**4,019**	**3,569**	**3,476**	**3,508**	**3,843**	**3,880**	**3,830**	**3,740**
Change, %		*-11.2%*	*-2.6%*	*0.9%*	*9.5%*	*1.0%*	*-1.3%*	*-2.3%*
Jewellery	2,712	2,288	2,404	2,191	1,770	2,000	2,200	2,200
Bar hoarding	264	235	236	392	165	200	200	200
Other	580	648	671	692	651	670	700	720
Consumption	**3,556**	**3,171**	**3,311**	**3,275**	**2,586**	**2,870**	**3,100**	**3,120**
Change, %		*-10.8%*	*4.4%*	*-1.1%*	*-21.0%*	*11.0%*	*8.0%*	*0.6%*
ETF investment	208	257	250	318	600			
Implied market balance	**255**	**141**	**-85**	**-85**	**657**	**1,010**	**730**	**620**
London spot fix, US $/ounce	**444**	**604**	**696**	**872**	**950**	**1,000**	**975**	**1,000**

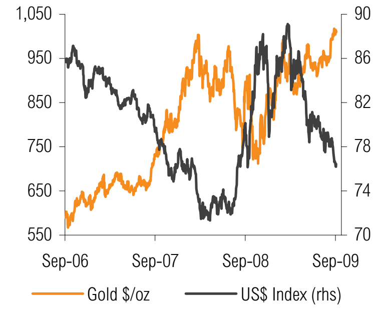
Source: GMFS, LBMA and RBS forecasts

The US dollar and inflation

In addition, gold's inverse relationship with the dollar is currently a strong one, not just because as a commodity it is generally dollar-denominated, but also because as a non-fiat currency it acts as a hedge against the risk of devaluation of paper currencies. The massive injections of funds into a number of government balance sheets, especially that of the United States, is raising fears both of sustained dollar weakness as the US government develops its exit strategy, as well as concern about inflation if that exit strategy is not timed and executed to perfection.

These concerns were heightened following the statement after the September meeting of the Federal Open Market Committee, in which the FOMC states that "economic conditions are likely to warrant exceptionally low levels of the federal funds rate (0-0.25%) for an extended period" and that it would extend the period over which it is buying agency mortgage-backed securities and agency debt.

Gold and the trade weighted US$ – simple correlation = 90% post G20



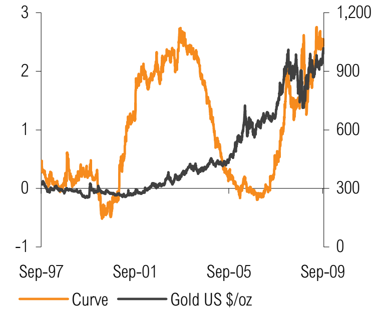
Source: Thomson Financial, RBS

Gold is therefore benefiting from three very potent fundamental financial ingredients: unpredictable international differentials, potential dollar weakness and anticipation of inflationary pressure…

… plus concern about unnatural markets

This is not all. Generally speaking, gold and the benchmark yield curve (two years to 10 years) have a close relationship as the strengthening in the gold price and the steepening of the US yield curve can both reflect inflationary fears. The recent relationship is particularly strong, with a simple daily correlation between the 2s-10s spread and spot gold standing at over 60% YTD. If anything, the situation this time is even more favourable than usual for gold since there is a degree of nervousness about whether the bond market is currently slightly false, given the Fed's presence in the market, mopping up US$1.75trn of Treasury issues and mortgage-backed bonds as part of the QE exercise and providing support in some bond auctions that might otherwise not have been well taken.

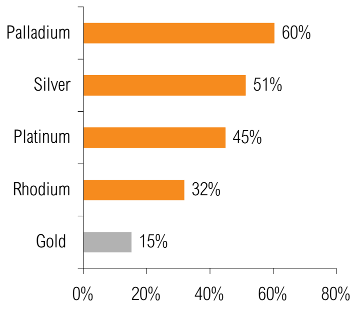
Gold and the US benchmark yield curve (2 years – 10 years)



Source: Thomson Financial, RBS

The clear message from world leaders is that there is still a very long way to go as far as economic stimulus is concerned. Both US Treasury Secretary Timothy Geithner and President Obama have emphasised the point, while IMF Managing-Director Dominique Strauss-Kahn has also urged sustained support since, in his view, the recovery will be "relatively sluggish." At least one European leader has voiced caution in the opposite direction, calling for rapid elimination of the huge expansion of monetary liquidity, but these words have now been borne away on a rising tide of liquidity. Some central bankers argue that a timely reduction in QE will result in a sustainable growth pattern without leading to unacceptably high levels of inflation. The proof or otherwise of this prognosis is some way in the future, but the debate is raging and while it does, gold – the canary in the mine – will remain at centre stage.

Gold: time to catch up with the rest of the sector?



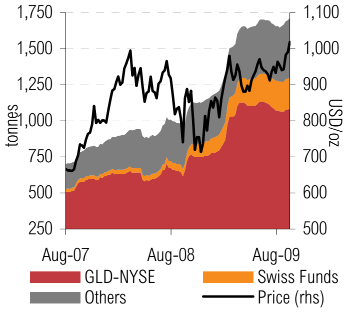
Source: LBMA, LPPM, RBS

ETFs activity; mid-year slippage is more than reversed in September

In Q1 09 the purchase of gold for ETFs was extraordinarily heavy as investors hedged against potential risk. At 459t over the period, it was not quite sufficient to absorb all the gold that the scrap market was generating, but it is certain that the activity in the over-the-counter market, which was also busy, would have been more than adequate to the task, as is evident in the fact that gold prices were rising not just in dollar terms but in the other major currencies as well.

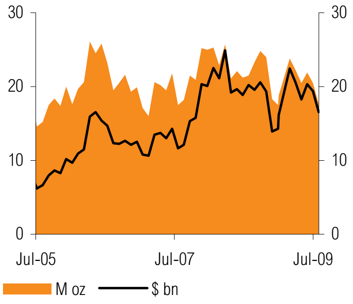
The momentum of acquisition in the ETFs slowed sharply in the second quarter, and from mid-June through to mid-August the funds were subject to small fluctuations as the markets succumbed to sluggish holiday conditions.

Gold ETF holdings are at a new record



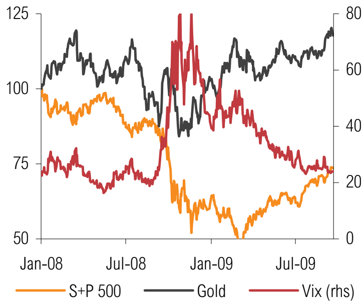
Source: Gold funds, RBS

LBMA clearing transfers: monthly average, m oz and dollars



Source: LBMA, LPPM, RBS

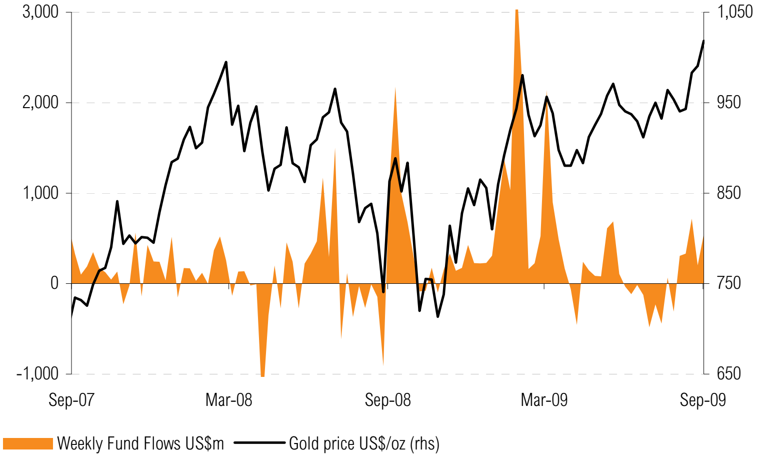
Gold and the S&P 500: both benefiting from good numbers



Source: Thomson Financial, RBS

September saw a revitalisation; the return of inflationary fears combined with the other aforementioned financial factors has prompted renewed interest in the funds, which have reached a new record of more than 1,700t, valued at US$56bn. The investment has been widespread, although the dominant changes have come from the SPDR® Gold Shares fund in New York, which has partially made up the losses sustained in June and July, along with the Exchange-Traded Security in London and the increasingly popular Swiss funds.

Net flows of funds to and from major gold ETFs, and spot gold price – after modest redemptions in July, inflows return in September



Source: Exchange-traded fund sponsors, LBMA, RBS

From the beginning of the year through to late September, the major ETFs added a net 535 tonnes of gold, which, on a simple linear extrapolation, would equate to almost 725 tonnes over the year as a whole. The momentum that developed in September, with an average weekly uptake of just over 15 tonnes, would, if sustained, take this year's investment to 750 tonnes. The prevailing sentiment in the market suggests that this could well be achieved.

September saw gold rally at the same time as the equities, reflecting a departure from the accepted historical norm – why?

The answer to this lies in two words: **risk** and **dollar**. Investors are now very finely tuned towards nuances of risk changes. The shift in market forces since mid-2008 now means that when good economic news comes through, even if it relates only to the US, the dollar tends to suffer as investors gain the confidence to move into assets with higher perceived risk. A gradual improvement in economic numbers during the middle of the year and into September has germinated into increased risk appetite on the part of investors that has put the dollar under pressure (at a 12-month low on a trade-weighted basis) and that has benefited the commodities sector as a whole. Of course, gold has a particularly strong inverse relationship with movements in the dollar.

Gold has gained a dual benefit here in that it has, as part of the commodities sector, enjoyed the natural increase in price that stems from a weakening in the dollar, but has also attracted the attention of a large number of investors who remain risk-averse to a degree and are seeking a hedge against adverse eventualities by diversifying into a broader range of assets, such as gold. In the past, gold has suffered the double whammy of migration from commodities and distress selling in order to raise cash, as seen in H2 08. This time it is enjoying its place in the sun as a hedge against both the dollar and against risk overall. As an added thought, gold is also now entering the seasonal gifting period.

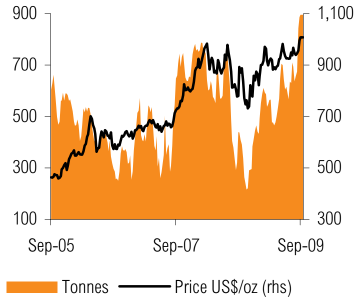
Speculators as enthusiastic as investors; gold net longs were also at a record in late September. Will this party lead to a hangover?

The speculative long position on COMEX also drifted lower during the latter part of June, but began to pick up in July, a month before the professional investment market took a renewed interest in gold. In late September, the net position was a record 895 tonnes, comprising 1,057 tonnes of longs (also a record) and 162 tonnes of shorts. These figures are recorded on a weekly basis. The increase in the net speculative position since the end of 2008 is 450 tonnes.

While the speculative position and the ETFs are ‘apples and pears’ since one is physical and the other is a margined, paper position, the combined increase of nearly 1,000 tonnes this year has been the key technical factor driving prices higher. The essential question is whether the physical market can sustain these higher prices from this point forward.

As we discuss next, we believe the answer is yes, and that the market will challenge US$1,050/oz before year-end and maintain high prices through 2010; much higher than that, however, is unlikely to be sustainable, in our view. The key is to also look at gold in, say, euro terms, where gold is still more than 15% below its record €790/oz price seen in March this year. To recapture that euro high would require a translated price of US$1,150/oz.

Net speculative long position on COMEX surges to record high



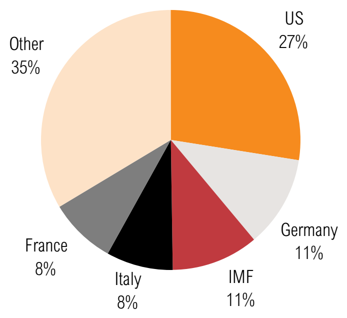
Source: CFTC, RBS

The official sector – getting really interesting

The IMF may make up part of the likely CBGA3 shortfalls, always assuming that its 403 tonnes of metal comes into the open market

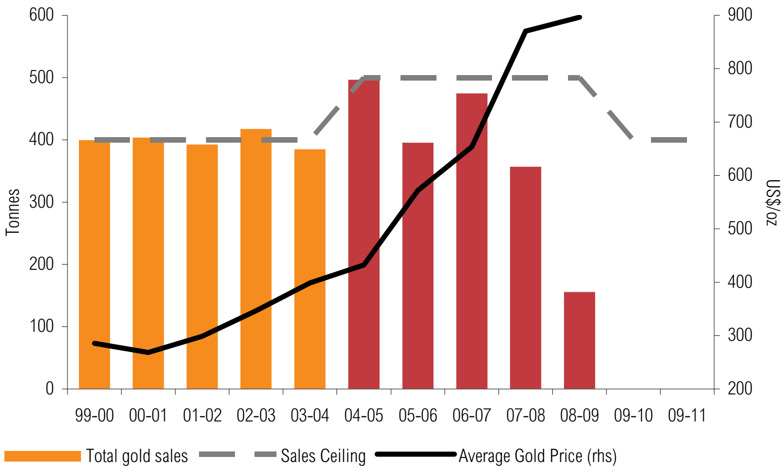
The new Central Bank Gold Agreement (CBGA 3) commenced on 27 September 2009, with the same signatories as CBGA 2, but with an annual cap of 400 tonnes of gold sales, back to the level of CBGA 1, whereas CBGA 2 had been 500 tpa. The new agreement also removes restrictions on gold lending and derivatives activity that were in place in the first two agreements. Sales under CBGA 2 were less than 1,900 tonnes, nearly 620 tonnes (or about 25%) below the nominated 2,500 quota.

Major central bank gold holdings, September 2009



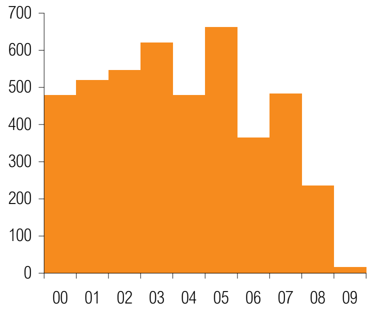
Source: WGC, IMF RBS

Annual gold sales under CBGA 1 & 2. Sales in 2008-09 were less than 160t, the lowest in 10 years. Ceiling for CBGA3 reduced from 500 tpa to 400 tpa



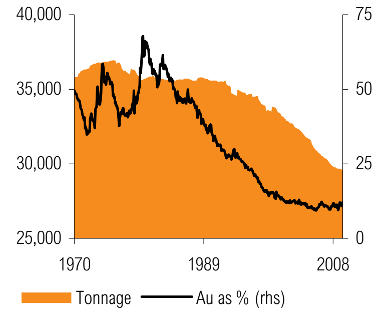
Source: GFMS, WGC and RBS

Net central bank sales 2000-09 are estimated at just over 4,400t



Source: GFMS, RBS

Gold comprised just over 10% of total world FX reserves



Source: IMF, Thomson Financial, RBS

Individual CBGA 3 quotas have not yet been made public, but it is very unlikely that many signatories will be seeking to sell in great volume. Germany, the largest gold holder, has restricted its disposals to small tranches, generally for coin programmes. Switzerland is not proposing to sell any more gold in the foreseeable future, and there has been no specific guidance yet from the Banque de France. Crucially, gold has been a great asset for the central banks. Furthermore, there must be some embarrassment regarding governments that sold their citizens' gold at bargain-basement prices!

Just under 12,000 tonnes are held by the signatories plus the ECB (which later may be a seller in order to maintain a gold:FX balance), and the disposal of 18% of this, especially in the current environment and with official sector attitudes changed regarding gold, appears extremely unlikely, in our view. Individual ECB signatory sales from the start of CBGA 2 to the end of June 2009 were as follows.

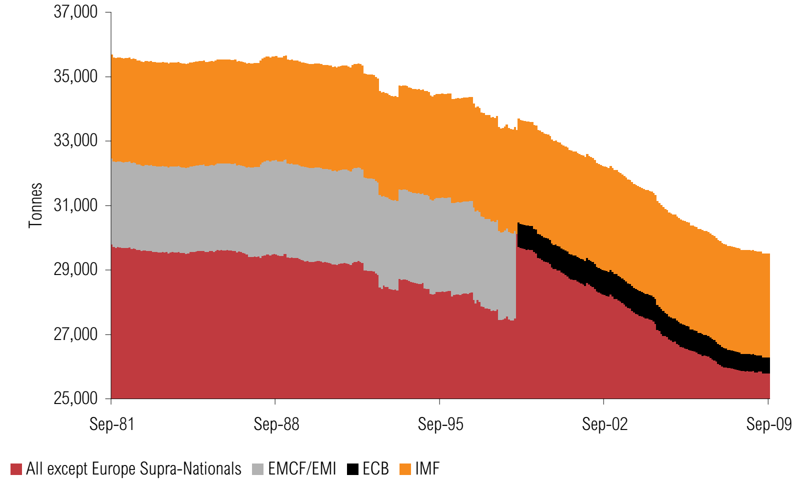
Sales from ECB signatories in the second CBGA, and their gold reserves at end-September 2009

Tonnes	Sales	end-Sept reserves		Sales	end-Sept reserves
France	578	2,445	Portugal	100	383
Switzerland	380	1,040	Sweden	54	131
ECB	272	501	Austria	38	280
Spain	242	282	Belgium	30	228

Source: ECB, IMF, GFMS Ltd, RBS

The IMF has now approved the proposed sales of up to 403.3 tonnes of gold. Although the IMF is not a signatory to the new Central Bank Gold Agreement, in their joint announcement in early August detailing CBGA 3 the ECB signatories noted that they recognise IMF's intention to sell 403 tonnes of gold and that such sales can be accommodated within the aforementioned ceilings.

World official sector gold holdings: IMF gold stood at 3,217 tonnes at end-Sept. '09, vs a world total of 29,635 tonnes, hence about 11% of total.



Source: IMF, RBS

The fact that the IMF has not become a signatory to CBGA 3 leaves open the possibility of one or more off-market transactions with other central banks. China is regularly touted as a likely candidate, and, indeed, this suggestion came up again in September (according to two unidentified "government sources"), but this is not really news either.

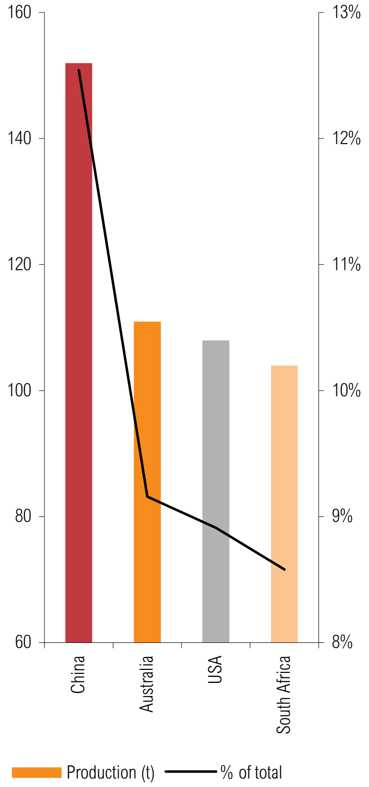
China announced earlier this year that its gold reserves had been raised to 1,054 tonnes since its last reported increase to 600 tonnes at the beginning of 2003. Meanwhile, Russia remains in the market, with an increase of 73 tonnes since end-2008 to 568 tonnes. There are also likely to be other countries on the acquisition trail – for example, the Philippines at up 20 tonnes thus far this year.

IMF sales will not disrupt the market and may yet be a hybrid of on- and off-market trades, while the announcement of an off-market transaction would be price-supportive.

Mine supply: to recover some lost ground in 2009

The mining sector has been showing signs of recovery, with increases driven both by new operations and mines that have been brought back on stream, taking forecast production for this year to about 2,500 tonnes, an increase of almost 90 tonnes on 2008. **More increases are expected next year, although the rate of gain falls sharply thereafter.**

Top four mine producers – H1 09 mine production and % of world total



Source: GFMS, RBS

Global gold production costs (US$/ounce). Cash costs in Q2 2009 were sharply higher vs Q1'09 with total production costs up 7.4%

	Q2 2008	Q1 2009	Q2 2009	Change, %
Australia	568	534	538	0.75%
Canada	518	398	432	+8.5%
South Africa	492	444	546	+23.0%
United States	446	511	510	-0.2%
Other	421	399	421	+5.5%
Average World	**463**	**443**	**470**	**+6.1%**
Gold Price	896	908	922	+1.5%
Cash Margin	433	465	452	-2.8%
Total Production Costs	**581**	**566**	**608**	**+7.4%**

Source: GFMS Update 1 and RBS

The first Update to GFMS's *Gold Survey 2009*, released in September, reported quarterly cash production costs for the world's different producing regions, an extract from which is shown here. The weaker dollar has seen producer currencies appreciate sharply this year. Cash costs in the second quarter of 2009 were up 6% qoq, representing an increase of US$27/oz to US$470/oz, with total production costs of US$608/oz up 7.4%, or US$42/oz.

Depreciating and then appreciating currencies have masked local changes, however. South African costs, for example, rose in rand terms 15% yoy, although the decline in the rand also meant margins improved by 48% in the quarter. A reversal of the currency in the second quarter, allied to continued increases in costs, meant that average **South African margins in the second quarter were only up in rand terms by 1% yoy**. South African gold producers have had to contend with not only a stronger rand, but also wage and power increases.

While currency movements also contributed to reduced costs in dollar terms in other major producing nations, new operations also contributed to the decline. These, along with mines ramping up to full capacity, added some 34 tonnes to mine production in the first half of the year and included the following.

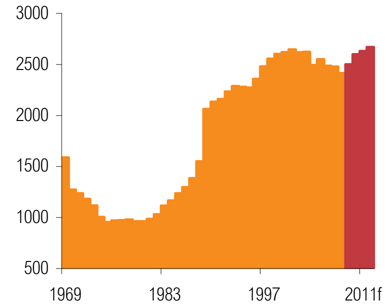
Selected new gold mines contributing to growth in world mine production in H1 09 – world gold mine production is estimated to have increased by 79t, or 7% yoy, in H1 09

Mine	Country	Company	Notes
Bonikro	Ivory Coast	Lihir Gold 85%	Gold; Long term ~4 tpa
Cerro Corona	Peru	Gold Fields Ltd	Cu:Au; 2009 prod ~11.7 t Au equiv
Goldex	Canada	Agnico-Eagle	Gold;~5.2 tpa
Higginsville	Australia	Avoca Resources	Gold; ~5 tpa
Kettle River-Buckhorn	US	Kinross	recommencement; ~1 tpa
Kupol	Russia	Kinross 75%	Au:Ag; ~4 tpa Au equivalent
Leonora	Australia	St. Barbara	Au; ~7 tpa
Mana	Burkina Faso	Semafo	Au; ~5 tpa
Pioneer	Russia	Peter Hambro Mining	Au; ~3 tpa

Source: GFMS Ltd., company reports, RBS

At 152 tonnes, **China** remains the largest gold mine producer in H1 09. This was a 13% increase on H1 08. **Australia**, which increased output by 6% yoy during the same period, registered 111 tonnes. The **US** was flat at 108 tonnes.

Gross gold mine production 1969-12F – supply forecast to snap back

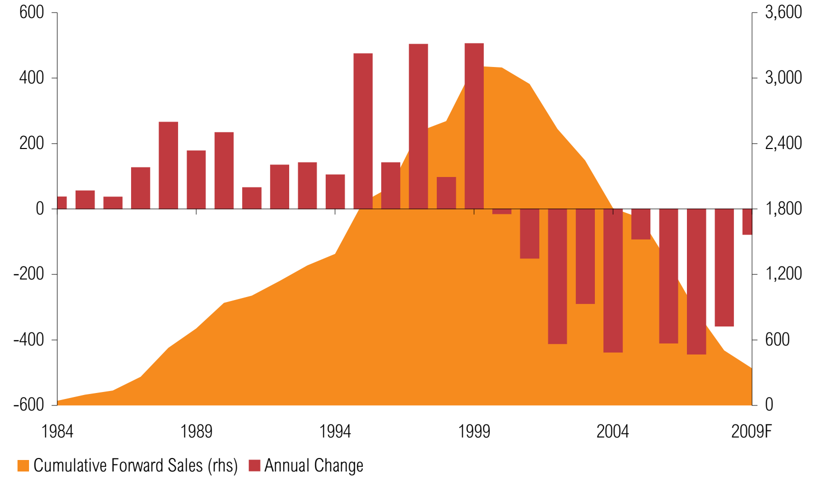


Source: GFMS, RBS

This means **South Africa**, for so many years the goliath of the world's gold mining industry, has been **relegated to fourth place** in the hierarchy, with a 10% decline to just 104 tonnes in H1 09, representing 8.6% of the world's production of 1,212 tonnes. This was a larger decline than the market had expected, given that the disruption to electricity supplies of the first half of 2008 had not been repeated. We expect global mine output to increase again in the second half of this year, largely as a result of new operations coming up to full capacity. The rate of increase slows thereafter, but we still forecast that total mine production will reach a fresh record high by 2012.

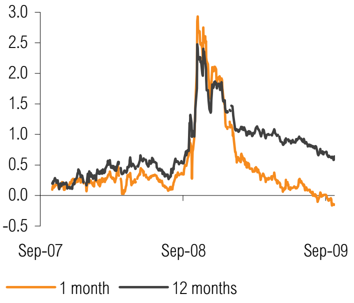
We believe the rate of *supply* into the market is likely to increase by more than 300 tonnes this year as dehedging falls away. The global hedge book was estimated to stand at about 460 tonnes at the end of June, but the announcement from **Barrick Gold Corporation** in early September that it is to wind up its fixed-price gold contracts means the book will be substantially lower by the end of this year. The figures provided in the release suggest that during the period July to 7 September the company effectively **absorbed 75 tonnes** of mine supply via the unwinding of a part of the fixed-price book, leaving an additional **93 tonnes outstanding** to be unwound "within the next 12 months" – ie by September 2010. These figures have been incorporated into our analysis, but the shorter-term impact of this unwinding bears a little deeper investigation.

Global gold hedges stood at 3,064t in 2000; now just 340t. The contraction in dehedging is adding materially to the rate of mine supply



Source: GFMS and RBS

Gold 1m and 12M lease rates: the spike reflected high LIBOR



Source: Thomson Financial

If we assume that Barrick's 75-tonne position reduction was spread over the period between the beginning of July and early September, then this would have equated, on a simple linear basis, to 7.9 tonnes per week, or 410 tonnes equivalent over the year as a whole.

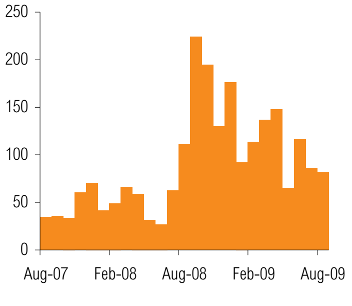
Bearing in mind that our jewellery demand forecast for this year is 420 tonnes fewer than last year, then over that short period of the third quarter, Barrick's activity was effectively taking up the equivalent of the shortfall. This goes some way towards explaining why there was steady support in the market whenever prices dipped over the period and gave the market a comparatively sturdy feel for a sluggish season in a sluggish year for demand.

Demand: recovering, now for the gifting season

Gold jewellery demand is notoriously price-elastic. Sharp upward movements in the local gold price tend to rapidly translate into sharply lower offtake both for chuk kam as well as adornment markets. The converse is also the case, where sharply lower prices stimulate bar hoarding and improve jewellery sales. **It's not so much the price level as prices achieving price stability.**

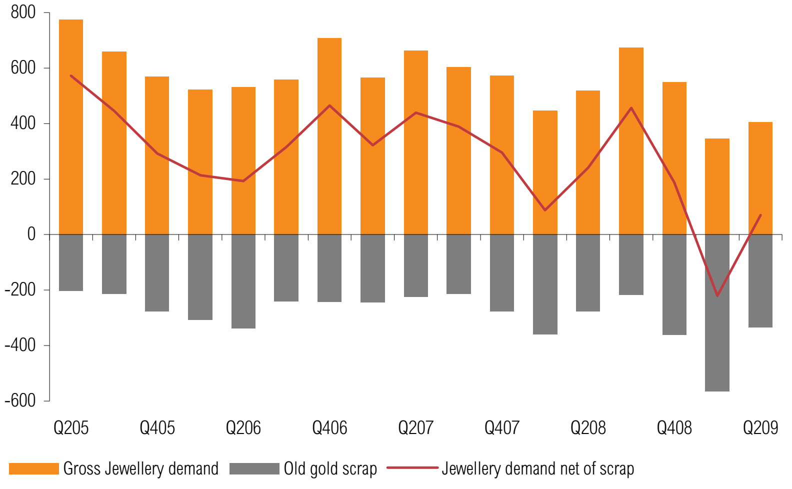
The appalling jewellery demand levels of the first few months of the year, generated by high and volatile local prices and weakened economic conditions, meant global scrap supply exceeded global jewellery demand in the first quarter of the year (see next chart). Scrap sales have been receding as conditions have settled, although there have been pockets appearing during gold's rally during the September price strength.

US mint: gold in US Eagle coins coming out of orbit (000 ozs)



Source: US Mint and RBS

Gross jewellery demand, total gold scrap return and jewellery demand net of scrap; Jewellery demand net of scrap is making a modest recovery



Source: GFMS Ltd and RBS

Near term, gold is about to get its seasonal demand bounce as the gifting season comes into focus. The onset of the Indian Festival Season, Diwali – Festival of Lights begins 17 October, and then the first Wedding Season, where Hindus gift gold to encourage prosperity. This is followed by the build-up to Christmas in the Western Hemisphere and tops out with gifting for the Chinese New Year. These events always result in an uplift in demand, but it is likely to be more marked this year in the West than in India, where jewellers still have inventory to work off, while European and North American jewellers are working more on a 'just-in-time' basis.

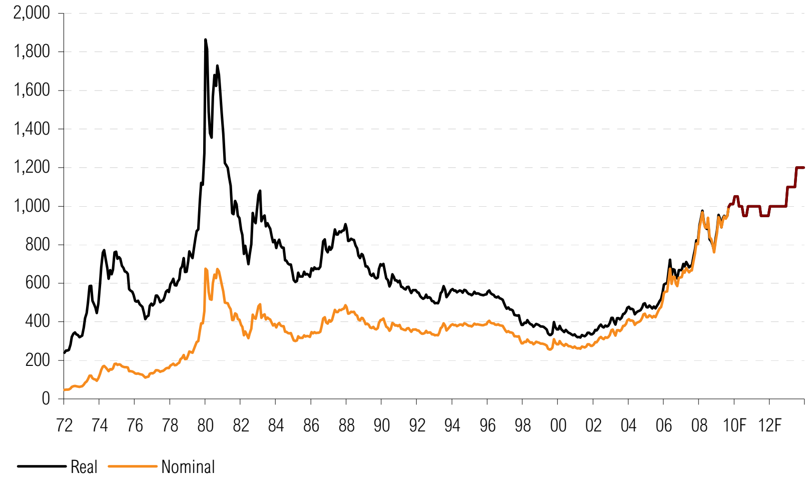
The expected improvement in spending in the fourth quarter is likely, therefore, to feed through to the international market relatively quickly – although gold has lost some small market share to high-end silver prices and it is not yet clear whether it can reclaim that lost ground.

We believe the gradual increase in consumer confidence, and the fact that price-responsive buyers are becoming accustomed to higher price ranges, points to a healthy improvement in activity in the fourth quarter, which should reinforce what had been an important, but crumbling, prop of support in the market.

Our counsel is to have some gold exposure

We are absolutely wedded to our long-held bullishness for gold. There are many strings to its bow. Some like its inverse relationship to the US dollar and are buying it on expected further dollar weakness. Others hold gold as an inflation hedge and fret about the re-appearance of inflation at both the headline and core levels. Others like gold as a commodity, where it proves itself time and time again. Indeed, what a timely reminder of man's enduring desire for gold when in September the UK's largest-ever hoard of Anglo-Saxon gold was found in a Staffordshire field. The 1,500 exquisite pieces of gold and silver, some bedecked with jewels, date to the 7th century. The discovery comes a few months after the discovery of the largest hoard of Iron Age gold coins, dated to 40 BC. It's a reminder of a time when gold was money and money was gold – a message to us all in today's 'sophisticated' world!

Gold price in US dollars – real vs nominal, 1972 -2013F. Despite the rise, still plenty of upside in real terms -US$/oz



Source: LBMA and RBS forecasts

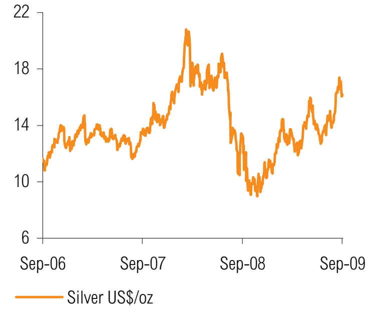
Gold has proved itself not to be a barbaric relic, but has come of age during this crisis as a serious component to an investment portfolio. Governments are stating that they will address the imbalances in the fiscal system, but the public is somewhat sceptical about the likely outcome, and fears of inflation and currency volatility should rightly sustain gold investment. Holdings in the Exchange Traded Funds may see some slight erosion from time to time as part of the normal course of market activity, but in general the metal is in firm hands. Whether the funds can continue to sustain their rate of uptake is an important question, and we have erred on the side of caution in that we are not looking for a large-scale, investment-driven change of price range in the coming months, but we do expect the market to sustain gold at its new higher levels, where US$1,000/oz will be viewed as normal rather than abnormal!

Silver

Partying to the hilt

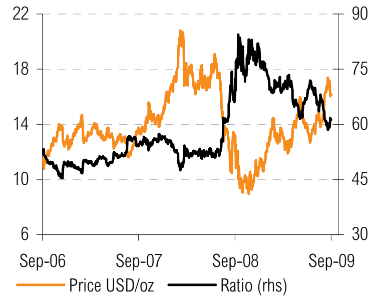
The prospects for sustained fiscal stimulus, bringing both a return to economic growth and the resurgence of inflation, played beautifully into silver's hands in the third quarter, and this most effervescent of metals made everything go with a fizz. The rally in gold through US$1,000/oz propelled silver rapidly from US$14/oz towards US$18/oz in a burst that saw the price rise more than 25% within three weeks. The linkage with gold became very strong as investors and speculators sought dual exposure to gold and silver on the basis of inflation hedging, while speculators took advantage of silver's higher volatility to maximise performance. The ratio between the two metals, which exceeded 80 at the beginning of the year, tumbled to below 60, and was also the subject of trading in its own right. By this stage though, retail investment was slowing and the market was developing a justifiable fear that the gaiety of early September might have some sharp, if short-lived, repercussions.

Silver price – irrepressible during the third quarter – perfect channel



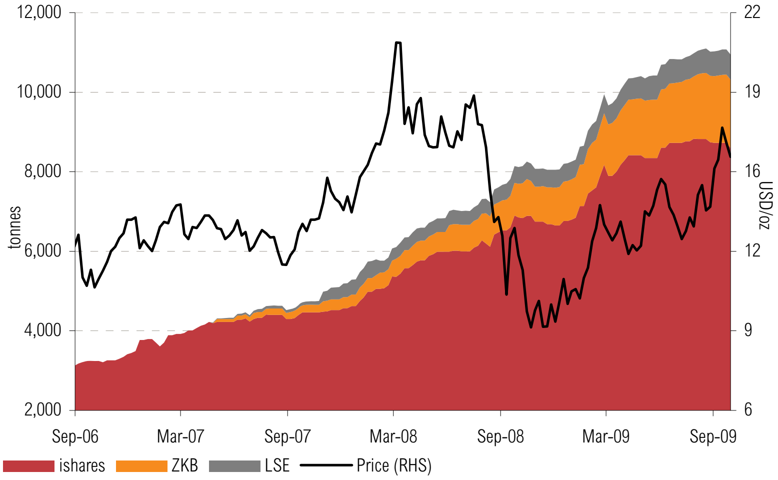
Source: LBMA

The silver price and the gold:silver ratio: now likely to hold close to 60



Source: Thomson Reuters, RBS

Silver holdings in ETFs and ETCs topped 11,000 tonnes in August, and ETF/ETC investment may be enough to absorb this year's surplus



Source: ETF Securities, iShares, ZKB, RBS

RBS world silver supply-demand balance, 2005-12F – investment demand needs to remain robust

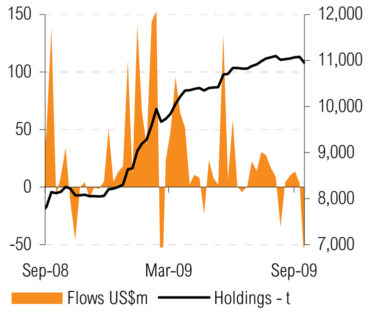
Tonnes	**2005**	**2006**	**2007**	**2008**	**2009F**	**2010F**	**2011F**	**2012F**
Mine production	20,026	19,945	20,660	21,179	21,600	22,000	22,500	22,500
Change, %	*3.7%*	*-0.4%*	*3.6%*	*2.5%*	*2.0%*	*1.9%*	*2.3%*	*0.0%*
Net government sales	2,100	2,432	1,316	961	450	300	300	250
Old silver scrap	5,786	5,847	5,658	5,493	5,400	5,200	4,900	4,700
Producer hedging	859	-211	-731	-174				
Total Supply	**28,771**	**28,013**	**26,903**	**27,459**	**27,450**	**27,500**	**27,700**	**27,450**
Industrial Fabrication	12,607	13,203	14,105	13,909	12,000	12,480	12,700	12,955
Photography	4,987	4,429	3,882	3,260	3,100	2,900	2,800	2,700
Jewellery, silverware and coins	8,762	8,313	8,149	8,725	8,800	8,625	8,475	8,700
Consumption	**26,356**	**25,945**	**26,136**	**25,894**	**23,900**	**24,005**	**23,975**	**24,355**
Change, %	*2.0%*	*-1.6%*	*0.7%*	*-0.9%*	*-7.7%*	*0.4%*	*-0.1%*	*1.6%*
Implied market balance	**2,415**	**2,068**	**767**	**1,565**	**3,550**	**3,495**	**3,725**	**3,095**
ETF investment		3,768	1,529	2,956	3,500			
Residual market balance	**2,415**	**-1,700**	**-762**	**-1,391**	**50**	**3,495**	**3,725**	**3,095**
London spot fix, US $/ounce	**7.31**	**11.55**	**13.38**	**14.99**	**14.50**	**17.50**	**16.00**	**16.75**

Source: GFMS, RBS forecasts

ETF investment has become sporadic – is some price aversion developing?

The silver ETFs began the year in a vibrant mood, but absorption began to slow in April and dwindled to a trickle in May. Their activity has since been spiky. Rather than gentle and steady trends, the silver funds have tended to be more or less dormant for periods, punctuated by sizeable changes, and interestingly these changes have often been in approximate multiples of US$25m. In the year to mid-September, the investment in these funds exceeded 2,800t, but the caution that had developed in the market at high silver prices suggests the average rate of accumulation may not continue through to the rest of the year. A reasonable forecast would be for some 3,500t of investment over the year as a whole, which is broadly in line with our forecast fundamental market surplus this year. This is a surplus that is more than twice the level realised in 2008, and which is likely to be broadly sustained over the foreseeable future.

Weekly fund flows in/out of the silver ETFs and total holdings

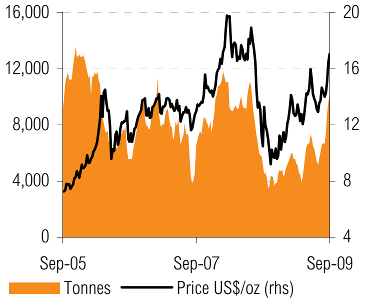


Source: ETF Securities, iShares, ZKB, RBS

Demand in 2009 is down with the notable exception of ETFs and coins

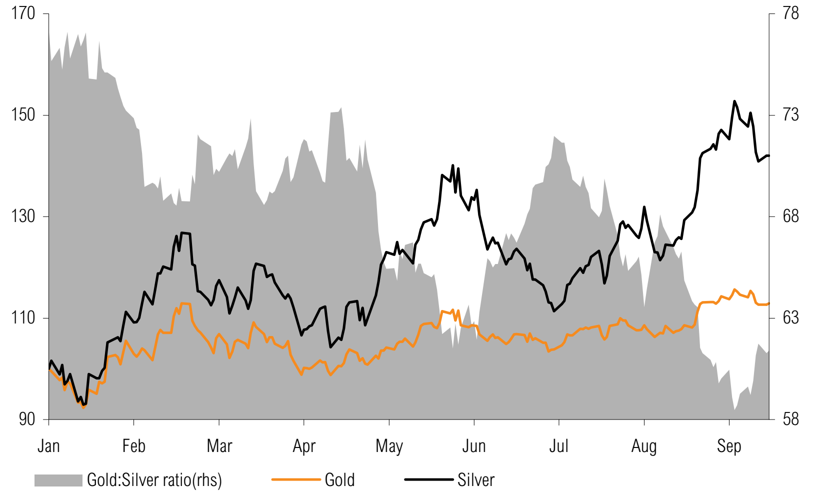
ETF demand, along with coins are the only areas of growth in physical offtake in 2009 as investors have looked to silver as a proxy for gold and have hedged against inflationary concerns. This could raise some concern for the future as ETF holdings and coin hoards are easily mobilised in times of distress or a change of investment view. So too are speculative positions, which have been highly instrumental in accelerating silver's upward trend in the third quarter. Although on a historical basis the speculative silver position on COMEX was not over-extended when the metal was trading in excess of US$17/oz in mid-September (nor was there much sign of physical dishoarding), the market was nevertheless ripe for profit taking.

COMEX non-commercial and non-reportable net silver position



Source: CFTC, Bloomberg, RBS

The silver and gold prices (Jan 2009 = 100) and the gold:silver ratio; the Au:Ag simple correlation exceeds 90% YTD

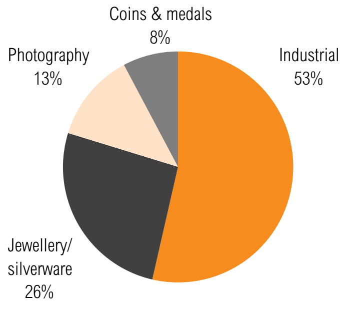


Source: LBMA, RBS

The economic environment has, of course, impinged on fabrication demand, although jewellery is holding up reasonably well as silver continues to take some market share from gold in the face of high prices. This is likely to continue in the future, although silverware is in a secular decline, both in the West and in more price-sensitive regions such as India, where consumers are increasingly inclining towards coins and bars rather than fabricated material.

Industrial demand has been hit as well, but technological developments mean that on a unit basis, silver demand continues to expand in the industrial sector, notably in electronics. Photography will continue to suffer its decline in the face of the digital onslaught, although this also means the photographic sector's contribution to scrap supply will also continue to diminish.

World 2008 silver fabrication demand by end use



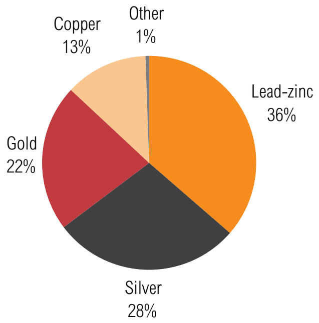
Source: GFMS, RBS

Silver supply is price-inelastic and on the increase

While demand has been under pressure but is now expected to stabilise, supply is beginning to increase and, although the increments are relatively small, they are nonetheless significant in terms of the marginal balance in the market. Cash costs of primary silver mine production are estimated to be in the region of US$5/oz today. Primary mine production accounts for about 28% of global mine production, and when industrial scrap return is included, primary silver mines are responsible for 22-23% of total supplies. At current silver prices, or even at prices considerably below prevailing levels, **virtually all silver supply is price-inelastic** (with the exception, of course, of bouts of dishoarding).

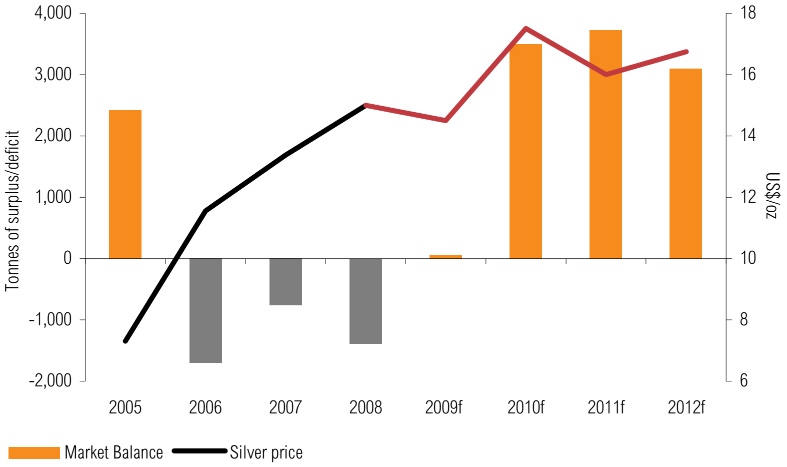
The possible exception to this is forward selling into price strength, but the forward market is thin and producers tend to prefer silver stream contracts, whereby they enter into long-term contracts with commercial counterparties, rather than risk skewing a thinly populated forward market. A good example of this is the recent deal between Barrick Gold and Silver Wheaton. Barrick sold silver production from selected mines plus a proportion of future output from the massive Pascua-Lama deposit (due on stream 2012) to Silver Wheaton, thereby securing financing for one party and a metal stream for the other.

Silver mine supply by source, %



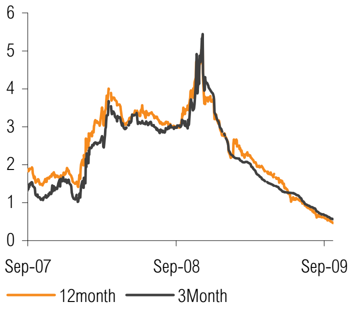
Source: GFMS, RBS

World silver supply/demand and price, 2005-12F. Hefty supply surpluses forecast out to 2012, investment demand will have to take up the slack



Source: GFMS Ltd, RBS

Silver implied lease rates (%) slide



Source: Bloomberg, RBS

Poor industrial fundamentals – but high prices

On the basis of the aforementioned fundamentals, a case can be made that silver ought to be trading at between US$5/oz and US$10/oz. In the current environment, however, with gold likely to remain strong on the basis of inflationary and fiscal concerns, silver now appears likely to continue to sustain prices in the double digits as long as there is buoyancy in gold investment for risk-related reasons. Physical investment in silver, both the ETFs and coins/bars, has, despite some wobbles, been remarkably robust and it may continue to absorb the fundamental surplus.

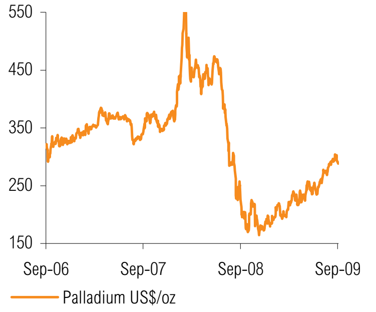
Once gold does lose momentum, however, either in the short term or the long term, we believe investors must be prepared for the short sharp shocks that silver is capable of administering. This metal is renowned for volatile price movements and its falls can be sharper than its rises.

Platinum and palladium

Platinum Group Metals comfortably eclipse gold

Platinum and palladium have remained the strongest metals in the precious complex and we continue to expect both metals to stage further gains in price, although there are arguments for a period of respite from their sustained bull runs before more improvements later this year and into 2010. There are key issues on both the supply and demand side of each metal's fundamentals, with platinum looking to the state of the South African mining sector and palladium pondering the prospects for Russian exports. Both factors have been supportive during the middle of the year as South African producers have faced falling profits and rising costs, while Russian exports have been running at lower levels than usual. There are some market nerves about the possible resumption of heavy Russian palladium shipments, but this is by no means cast in stone and, in our view this year's overall palladium deficit is likely to be a big one.

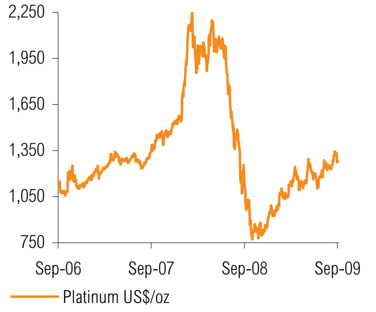
Palladium the best of the precious metals since end-2008, up 60%...



Source: LPPM

Demand for both metals was boosted in recent months as a result of the various automotive scrappage incentives, but will likely come under pressure in the months ahead as these programmes tail away. Platinum jewellery demand is staging a strong comeback, and consumers appear in the main to be accepting rising prices. Investment in ETFs has remained steady, while speculative positions on NYMEX have reached record levels, and this could result in some temporary overhead pressure. There is no news yet on the progress of the applications for Exchange Traded Instruments in the US, but this is nothing to worry about, in our view, as the 'quiet period' can last many months while the authorities conduct their due diligence.

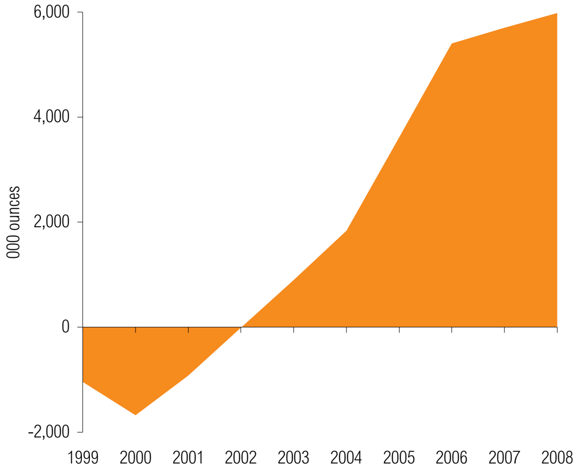
… while platinum added 40%; both are set for further increases



Source: LPPM

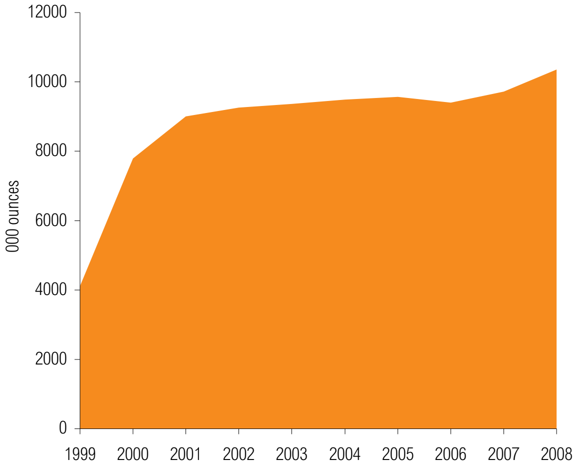
Platinum has sustained the bull market that it started in October 2008, although the shifting sands of investors' risk appetite has meant that the run has been punctuated by more than one period of reasonably deep correction. In mid-September, platinum challenged US$1,350/oz, a 12-month high and a gain of 40% from the beginning of 2009. Palladium turned upward last December and breached US$300/oz in mid-September, also a 12-month high and a gain of 60% since the beginning of the year, while rhodium has gained 33%, not enough to help producers' margins by much. We expect the platinum market to be broadly balanced and the palladium market to sustain fundamental deficits, prior to investment, for the next few years and we continue to recommend exposure to these metals.

Changes in palladium's residual market balance results from government and other stock movements



Source: GFMS, RBS

Cumulative release of palladium from global stockpiles – the rundown of stocks cannot continue for ever



Source: GFMS, RBS

RBS world platinum supply-demand balance, 2005-12F – we expect the platinum market to be broadly balanced in the coming years, but only prior to ETF investment

000 oz	2005	2006	2007	2008	2009F	2010F	2011F	2012F
South African mine production	5,054	5,447	5,074	4,671	4,550	4,765	5,015	5,315
Other mine production	1,570	1,577	1,509	1,480	1,380	1,430	1,460	1,480
Total mine production	**6,624**	**7,024**	**6,583**	**6,151**	**5,930**	**6,195**	**6,475**	**6,795**
Change, %	*3.3%*	*6.0%*	*-6.3%*	*-6.6%*	*-3.6%*	*4.5%*	*4.5%*	*4.9%*
Autocatalyst scrap	802	836	921	998	850	1,200	1,200	1,300
Jewellery scrap	340	350	543	910	299	330	300	330
Total supply	**7,766**	**8,210**	**8,047**	**8,059**	**7,079**	**7,725**	**7,975**	**8,425**
Change %		*6%*	*-2%*	*0%*	*-12%*	*9%*	*3%*	*6%*
Emission control catalysts	3,858	4,043	4,139	3,814	3,025	3,150	3,450	3,600
Jewellery	2,132	2,032	1,872	1,646	1,650	2,000	2,100	2,200
Other industrial use	1,821	1,776	1,950	2,334	2,390	2,450	2,500	2,500
Consumption	**7,811**	**7,851**	**7,961**	**7,794**	**7,065**	**7,600**	**8,050**	**8,300**
Change, %	*2.4%*	*0.5%*	*1.4%*	*-2.1%*	*-9.4%*	*7.6%*	*5.9%*	*3.1%*
Implied market balance	**-45**	**359**	**86**	**265**	**14**	**125**	**-75**	**125**
ETF investment			194	102	300			
Implied residual balance	**-45**	**359**	**-108**	**163**	**-286**	**125**	**-75**	**125**
London spot fix, US$/oz	897	1,142	1,305	1,572	1,200	1,450	1,550	1,600

Source: GFMS, RBS forecasts

The supply side – hanging on by the skin of its teeth, Anglo Platinum to be the swing producer

The majority of South African platinum producers are struggling under weighty burdens, and the financial results announced in the third quarter of the year brought this home. There have been very few published amendments to production schedules during the period (but equally no reinstatements of previously announced cuts, as detailed in our April 2009 *Commodity Companion*).

Anglo Platinum, the world's largest platinum producer, did make an interesting statement in its interim results, in which it recorded a 95% collapse in headline earnings. The company had already stated that it was managing its mine output (first-half platinum production was 1.06m oz; sales 1.22m oz) and announced that its target of 2.4m oz for the full year remained in place.

Anglo Platinum's CEO stated in the report, however, that the company would utilise process pipeline inventory stocks "as required to meet market demand." Our forecast for the year shows the platinum market broadly in balance overall (prior to investment activity) and, although auto demand is dipping towards the end of the third quarter, this balance is likely to have been composed of a surplus in the early months of the year, moving latterly towards deficit.

South African platinum miners; earnings changes and cost considerations, mid-2009

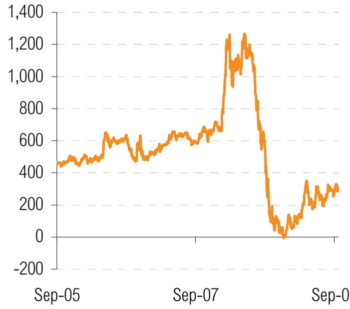
Company	Earnings change yoy	Cost comments	Strike-induced production losses
Anglo American Platinum	-95%; six months period to end-June	Cash operating costs down 6.4% on H1 2008	n.a.
Impala	-52%; full year to June	Unit costs up 32% per platinum ounce	~50,000 oz, revenue R720m
Lonmin	Into a loss, six-month period to end-March	Expecting gross operating rand costs to be down for full-year 2009	n.a.
Northam	-57%, full year to end-June	Cash costs up 14%	
Aquarius	Net loss reduced via production improvement	Cash costs per PGM ounce up 22% yoy	15,000-20,000 oz of PGM
Platmin	n.a.	n.a.	Ramp-up delayed; working to minimise impact in terms of time

Source: Company reports, Reuters, RBS

This statement implies that **Anglo Platinum is prepared to act as swing producer** to prevent excessive price volatility, thereby conserving price-elastic demand sectors, notably jewellery.

The miners have been battling to contain production costs, while the prices of the four PGMs have been substantially reduced in rand terms. Platinum, for example, averaged 33% less in rand terms in the first half of this year than in H1 08 – the weakening of the rand at that point had cushioned losses, given that the dollar average was down 44% – while in the third quarter to date the rand and dollar prices of platinum are down by 24% and 26% yoy, respectively. The palladium average price was down 51% in dollar terms and 42% in rand terms in the first half, and by 25% and 23% in the third quarter to date. The average dollar price of rhodium was down by a whopping 86% in H1 09 and by 77% in rand terms; in the third quarter so far the decline is 23% and 22%. While gold was similar in rand terms in the first half, and averaged 11% higher in the third quarter to date, this was by no means enough fully to mitigate the effects of the declines in the PGM prices on the operating margins of the miners.

The platinum-gold premium has averaged just US$210 year-to-date



Source: Bloomberg, RBS

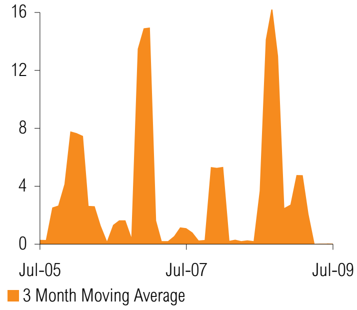
Although PGM prices are rising, mining companies will remain under pressure for some time to come. While some operations are ramping up to full production, the other expansions or greenfield developments that were deferred or delayed in 2008 are unlikely to be reinstated in the foreseeable future, in our view.

Palladium supply − Russian shipments have declined as expected and the market appears strong enough to absorb any later increase

Norilsk's results for H1 09 show production of 1.282m oz of palladium and 300,000 oz of platinum. This was 156,000 oz of palladium and 38,000 oz of platinum less than in H1 08, but only very fractionally below the production rates of the second half of 2008. Norilsk is concentrating on stable production levels with a view towards maximising sales, and again the market's concentration is on total Russian exports and the implied amount of metal that may be coming from state inventories.

In our April *Commodity Companion* we noted that a senior Almaz official had forecast a dwindling in palladium exports from Russia during the middle of the year as the new legislation revoking Almaz's previous monopoly on palladium exports was put into place. Exports have indeed fallen, but while we believe the Almaz theory holds water, we believe it is also possible that sales have been constrained in response to the reduced requirements of the market.

Recorded Swiss imports of palladium from Russia (tonnes)



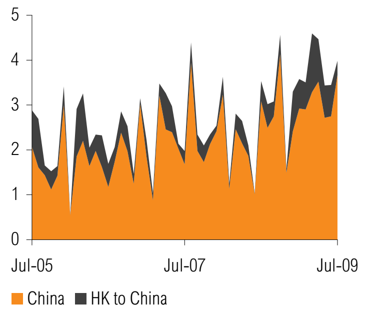
Source: Global Trade Navigator

Russia's exports to its major palladium trading partners were down by about 420,000 oz in the first seven months of this year compared with January-July 2008, a decline of 23%. We expect a decline in net palladium demand of half a million ounces, with the pattern similar to that of platinum – ie a stronger rate of demand in H2 than in H1. There is therefore, in essence, scope for the market to absorb any resurgence in supply. Or is there? Russian exports to Switzerland – platinum and palladium's terminal market – were virtually zero in March to July, but we must still remember that implied inventories in Switzerland have increased by 1.9m oz since the beginning of 2005 and that there is, in theory at least, plenty of metal available to the market should there be a requirement for it. What is not clear, of course, is the price at which such metal might become available.

Russian imports into Japan and the US combined were down by a million ounces in the first seven months of this year, while exports to Hong Kong and China are up by almost 200,000 oz, reflecting the dynamics of market demand.

Demand − both metals are now looking at a temporary slowdown in automotive offtake, while platinum jewellery remains reasonably robust

China platinum imports + Hong Kong's exports to China (tonnes)



Source: Global Trade Navigator

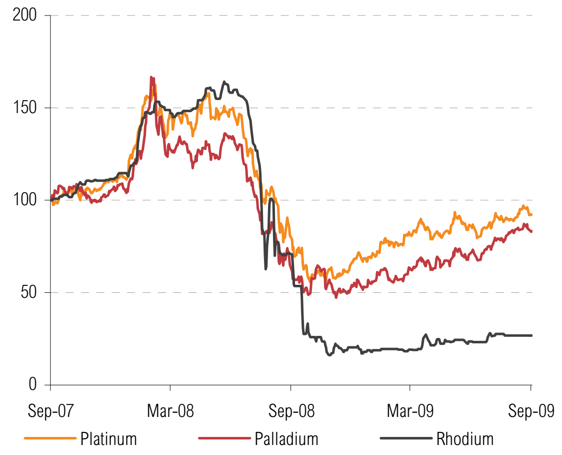
The chart at the left shows how Chinese demand for platinum appears to have remained resilient even in the face of the recovery in prices this year. The market for jewellery is by no means mature in China and so far has been concentrated (with the exception of bridal ware) largely in the major conurbations. After peaking at more than 1.2m oz in 2002, it embarked on a price-driven decline as gold fought back and palladium made its mark as a potential substitute. The market bottomed in 2006 and has been making a steady recovery. It had appeared for a good part of this year as if the US$1,200/oz level was an important tipping point of the market, but as we have moved through the third quarter this price has become more acceptable and the entry barrier has been rising, especially as platinum's premium over gold has been narrow by recent historical standards.

Chinese imports not quite what they seem, but we believe probably no cause for concern

One cautionary note is that the high level of imports into China and Hong Kong are bound to reflect a degree of inventory building, whether for strategic or industrial reasons. However, in our view this is not necessarily as ominous as it looks. With the exceptions of vehicle emission control catalysts, jewellery and electronics the vast majority of other end uses of platinum are in-process catalysts. Thus platinum-rhodium gauze is important for oxidising ammonia to nitric acid, for example, while platinum is used in bushings for the manufacture of fibre glass and platinum catalysts are used for petroleum reforming and catalytic cracking. This means that day-to-day demand for platinum in these sectors is for the metal necessary for the regeneration of spent catalyst, and the losses on these catalysts are generally minimal.

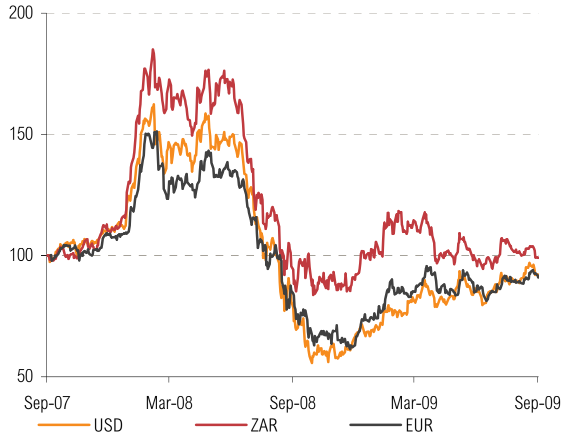
However, for a catalyst to be 'spent' it must first be installed, and the amount of fixed investment in the Chinese (and other Asian) economies suggests that much of this metal may have been taken to equip new plant. It may therefore be a 'one off' and does not mean necessarily that this material has gone into stockpile for subsequent release on a change of investment view. We believe it is probably safe to argue that it has gone off-market – but, equally, that these levels of imports may not be the sign of things to come.

Platinum, palladium and rhodium US dollar prices (September 2007 = 100)



Source: Thomson Reuters, RBS

Platinum in US dollar, euro and rand terms (September 2007 = 100)



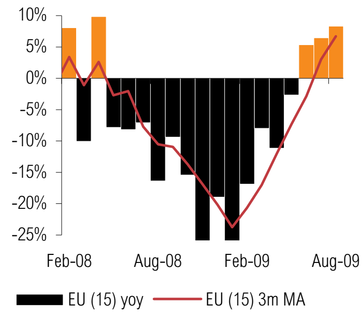
Source: Thomson Reuters, RBS

RBS world palladium supply-demand balance, 2005-12F – we expect the palladium market to sustain fundamental deficits in the coming years, even prior to ETF investment

000 oz	2005	2006	2007	2008	2009F	2010F	2011F	2012F
Russian mine production	3,133	3,164	3,049	2,712	2,660	2,660	2,660	2,660
Other mine production	3,822	4,191	4,032	3,669	3,500	3,700	4,050	4,050
Total mine production	**6,955**	**7,355**	**7,081**	**6,381**	**6,160**	**6,360**	**6,710**	**6,710**
Change, %		*5.8%*	*-3.7%*	*-9.9%*	*-3.5%*	*3.2%*	*5.5%*	*0.0%*
Autocatalyst scrap	626	744	951	1,184	950	1,350	1,800	2,000
Jewellery scrap	103	234	184	195	150	130	130	150
Total supply	**7,684**	**8,333**	**8,216**	**7,760**	**7,260**	**7,840**	**8,640**	**8,860**
Change, %		*8%*	*-1%*	*-6%*	*-6%*	*8%*	*10%*	*3%*
Emission control catalysts	3,924	4,330	4,719	4,416	4,000	4,500	5,000	5,200
Jewellery	1,363	1,281	1,283	1,301	1,300	1,430	1,500	1,500
Other industrial use	2,477	2,549	2,535	2,682	2,600	2,650	2,750	2,800
Consumption	**7,764**	**8,160**	**8,537**	**8,399**	**7,900**	**8,580**	**9,250**	**9,500**
Change, %		*5.1%*	*4.6%*	*-1.6%*	*-5.9%*	*8.6%*	*7.8%*	*2.7%*
Implied market balance	**-80**	**173**	**-321**	**-639**	**-640**	**-740**	**-610**	**-640**
Stock movements	1,858	1,613	900	1,300				
ETF investment			280	381	450			
Implied residual balance	**1,778**	**1,786**	**299**	**280**	**-1,090**	**-740**	**-610**	**-640**
London spot fix, US$/oz	201	320	355	351	250	350	400	475

Source: GFMS, RBS

Monthly EU passenger car registrations – % change yoy



Source: ACEA, RBS

The automotive sector − good times, bad times

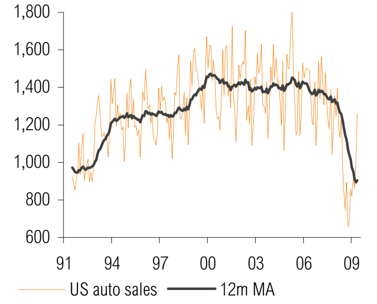
We have written at length about the state of the auto sector in our weekly *Precious Metals Review and Commodity Compendium*. The latest position is that the US cash-for-clunkers programme closed after just a month, and over 90% of the dealers' claims have been approved for payment from central funds. The US$3bn programme resulted in the sale of more than 690,000 new light vehicles in the US, and we have postulated that, if the August-December average sales rate equals that of January-July, then the September-December average light-vehicle sales would have to fall 13% from the average for the first seven months. In mid-September, it appeared as if this calculation, which we felt at the time was somewhat gloomy, was coming about, as the figures for the early part of the month suggested a likely annualised rate of 8.8m units, compared with a total for 2008 of 13.2m. Dealer profits per vehicle are also sliding, so there may yet be more attrition to come in this side of the industry.

Europe − the German scrappage incentive scheme has ended; France's, Italy's and the UK's schemes are also ending

European sales have held up better than those in the US (which therefore favours platinum rather than palladium as a result of platinum's much higher diesel penetration in Europe), but this is partly because more money has been pumped into the system. The **German** scheme involved US$7bn and has been exhausted more than four months ahead of schedule, while the **French** government is considering extending its own programme, which along with those of **Italy** and the **UK** is nearing exhaustion (though the scheme has recently been now extended to allow for an additional 100,000 vehicles).

The German programme raised August registrations by 28% yoy, although the overall results from the scheme have by no means shown up in the registration statistics yet. In early September, only 850,000 of the 2m applications had filtered through into the figures. Of these, some 75% were for new vehicles. Europe, too, expects a hangover after the party, with Volkswagen's head of sales looking for a potential decline of 27% in Germany next year, to 2.6m-2.8m vehicles, down from a projected 3.7m vehicles in 2009.

US monthly auto and light-truck sales (000 units)



Source: Bloomberg, RBS

The impact of these scrappage schemes on PGM demand was positive this year. We calculate that the difference **is not much more than 100,000 oz in either market.** There should also be a knock-on effect when the scrapped catalysts feed through into the market in 2010, with a higher amount coming back than was taken off (perhaps 125-150,000 oz of each metal) because of the larger size of the vehicles that were returned and the substantial downward shift in the size of the new vehicles being bought. These figures have been incorporated into our supply-demand balance projections.

We expect gross fabrication of platinum and palladium into auto catalysts to resume its growth next year in all regions, although we expect the one relatively weak spot to be Europe, with platinum offtake broadly flat (but palladium offtake increasing).

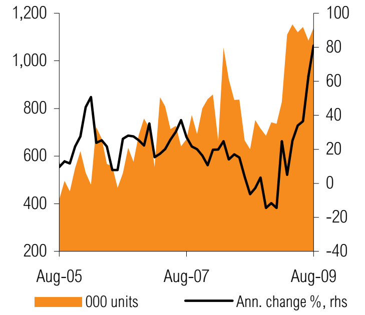
Longer term, palladium scrap in particular to balloon

There is a massive pool of palladium metal being built up ‘on the road’. GFMS Ltd’s research shows that the highest proportion of scrapped end-of-life vehicles in 2008 were aged between 13 and 15 years, and extrapolates to suggest that in 2013, the highest proportion of scrapped vehicles will be from cars hitting the road between 1998 and 2001, when palladium demand was soaring as a result of platinum to palladium substitution. As average PGM loadings increase, there are implications for longer-term scrap return for both metals, but we expect growth in palladium scrap returns to exceed platinum in the coming years.

China − sustained strength in automobile manufacturing is raising fears of over-capacity in the medium term

Chinese vehicle production has remained buoyant, largely as a result of the national economic stimulus, and the outlook for the foreseeable future remains rosy, with both platinum and palladium demand in the Chinese auto sector expected to increase by more than 100,000 oz pa over the next 18 months to two years. For the longer term, there is some concern that the buoyancy in the sector may result in overcapacity. For now, however, auto sales in China reached 7.2m units in the first seven months of the year, a 23% gain on January-July last year. Local projections are forecasting sales of 16m units by 2012.

Chinese vehicle sales are soaring, but there are fears of overcapacity



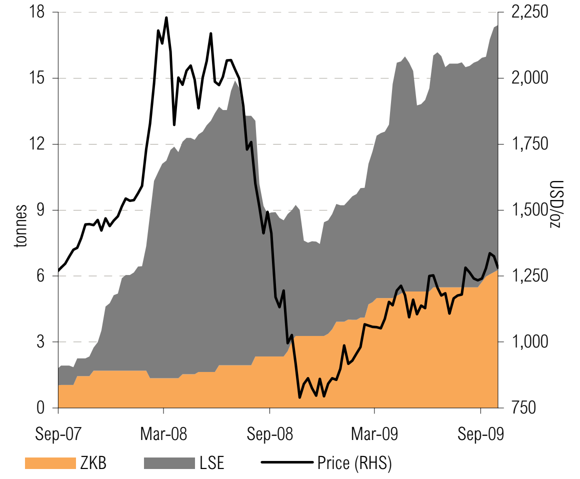
Source: Thomson Financial, RBS

With the US auto industry now licking its wounds and looking to the future, the industry should emerge leaner, fitter and ready to expand when the market is ready for it. There is bound to be a period of convalescence, but the medium-term outlook is healthy, especially as emission-control regulations continue to tighten, and despite the facts that motorists are reducing the average size of the engines on the road and hybrids are beginning to generate increased consumer interest.

Investors offer medium-term upside potential, but speculators may prompt a short-term dip in prices of both metals

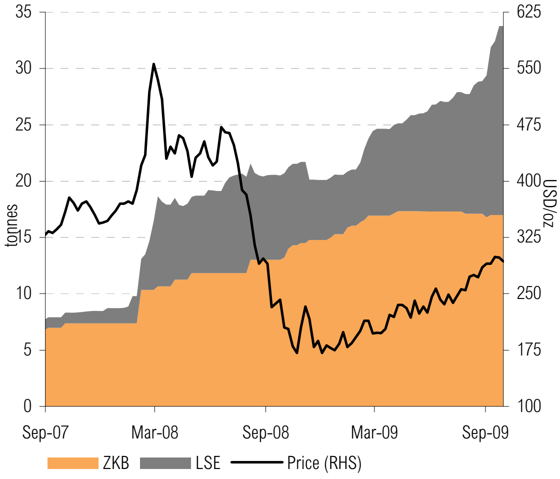
Investor activity, as measured by the changes in Exchange Traded Funds, was relatively active in the first half of 2009 and has eased slightly during the third quarter. At the beginning of the year, platinum ETFs held 297,000 oz of metal and by the end of the first half this had increased to 489,000 oz; from then through to late September the additional increment was about 70,000 oz. The first half thus saw metal acquired at an average weekly rate of almost 7,500 oz, slipping to 5,500 oz per week from the beginning of July to late September .Redemptions, when they came, were small.

Platinum ETF holdings and price – holdings have been relatively stable in Q3 09, despite price volatility



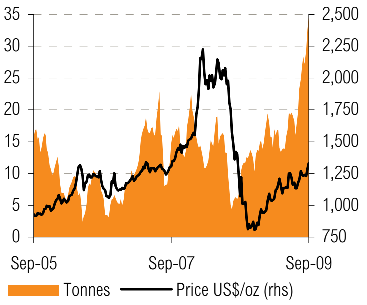
Source: ETF Securities, ZKB, RBS

Palladium ETF holdings and price – inflows accelerate in September



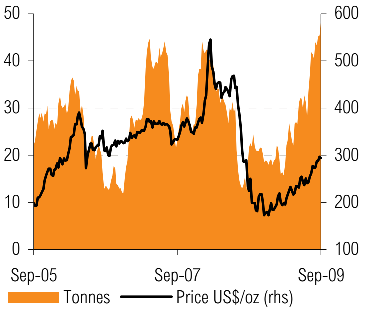
Source: ETF Securities, ZKB RBS

Net NYMEX non-commercial and non-reportable platinum position



Source: CFTC, RBS

Net NYMEX non-commercial and non-reportable palladium position



Source: CFTC, RBS

The story has been similar in the palladium market, but investors have been rather more bullish towards palladium, with ETF inflows gaining momentum in the third quarter. At the beginning of the year the palladium ETFs held just over 660,000 oz of metal. By the end of June, this had increased to 878,000 oz (weekly average rise of nearly 8,500 oz) and in late September, after passing the million ounce level, holdings were 1.09m oz so that the weekly average rate of acquisition in July to late September was a more than respectable 17,000 oz.

If this latter rate of accumulation were extrapolated on a very simple linear basis, then it would be equivalent to a full year of about 650,000 oz, or roughly half the world's estimated palladium demand in jewellery this year. This investment activity, reflecting the market's expectation for an improving supply-demand balance, suspicions (accurate or otherwise) that the **Russian state palladium reserves might be nearing exhaustion**, and aided also by the sharp declines that palladium sustained in 2008, helped the price reach a 12-month high exceeding US$300/oz in mid-September.

We have been deliberately conservative in our estimates for full-year demand in both the palladium and platinum ETFs in our supply-demand balance forecasts. We would expect that for the foreseeable future the hands that are holding this metal are firm.

The same may not be the case with respect to the speculative positions on NYMEX. The palladium position reached a record of over 1.5m oz in late September, with the outright gross speculative long position at nearly 1.9m oz. Some profit taking developed after palladium reached US$300/oz (although there was also some short covering) and any slowing of momentum in the metals sector is likely to generate more such selling. A similar position applies to platinum, which reached a record on NYMEX at 1.1m oz in late September, and it too may be vulnerable to some profit taking.

For the medium term, however, the fundamentals of both metals are among the strongest in the sector and platinum and palladium remain our most favoured metals in the precious metals complex.

Iron ore

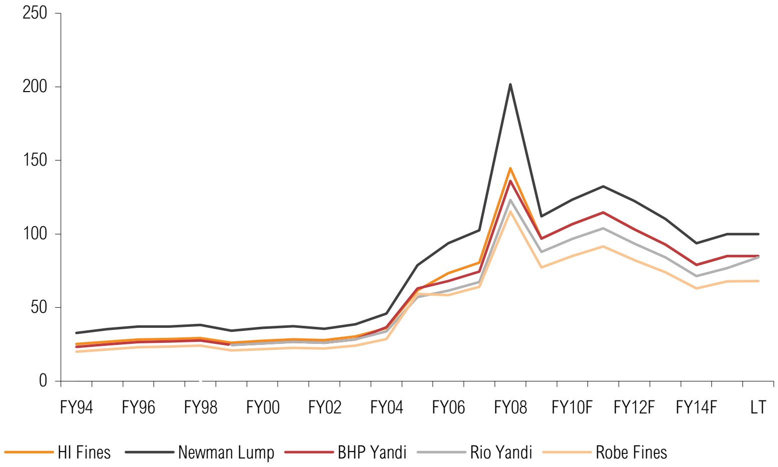
Warren Edney, Australia
Senior Mining Analyst
warren.edney@rbs.com
+613 9612 1557

RBS Australian Mining Team

Structural change in iron ore

We are changing our calculation of long-term iron ore prices to reflect the shift in the role of price-setter from Japan, which relies entirely upon imported iron ore, to China, which can also source domestic production.

Iron ore price profile (USc/dmtu)



Source: TEX, RBS forecasts

Long-term prices derived using a blend of Australian and Chinese incentive prices

In the past we used our estimate of the incentive price for Australian iron ore production to set our long-term iron ore price assumption. However, this method does not adequately reflect the change in the market, with China becoming the major buyer of seaborne iron ore and its ability to source domestically mined iron ore, either as the marginal supply or as a consistent proportion of feedstock. We now use a blend of the Australian incentive price and our estimate of the Chinese marginal weighted price using the proportion of China's imports vs its domestically sourced iron ore. This implies a long-term fines price of US85c/dmtu, up from US65c/dmtu.

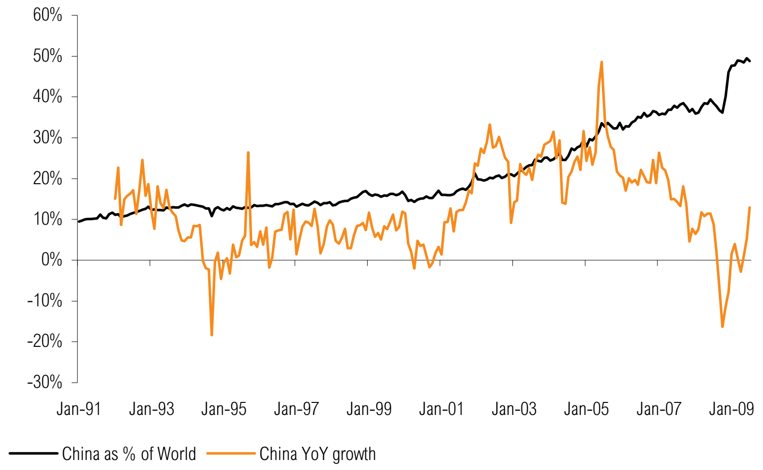
China role more important than ever

We raise our long-term fines iron ore price from US65c/dmtu to US85c/dmtu by taking into account the effect of the marginal cost of production in China as well as the incentive price of new capacity in Australia

Changed dynamics

The dynamics of demand and supply of steel-making raw materials have changed dramatically over the past three years. The price-setting mechanism has moved from the Japanese steel industry, which relied upon imported iron ore as its sole source of supply, to the Chinese steel industry, which is now the largest importer of iron ore, but which also relies upon domestic iron supply for what might be termed 'the marginal tonne'. We believe it is therefore important to take into account not only the economics of iron ore production from traditional suppliers such as BHP, RIO and Vale, but also the cost of production in China. It is our impression that the non-integrated Chinese iron ore producers are largely driven by making cash and do not run capital-intensive operations; hence, internal rates of return and after-tax profits do not play a significant role in the decision to open or close a mining operation.

China's share of global steel production and production growth

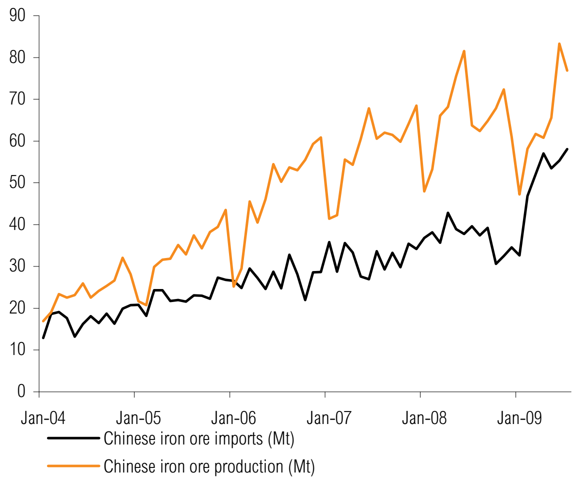


Source: IISI, RBS estimates

China in a global context

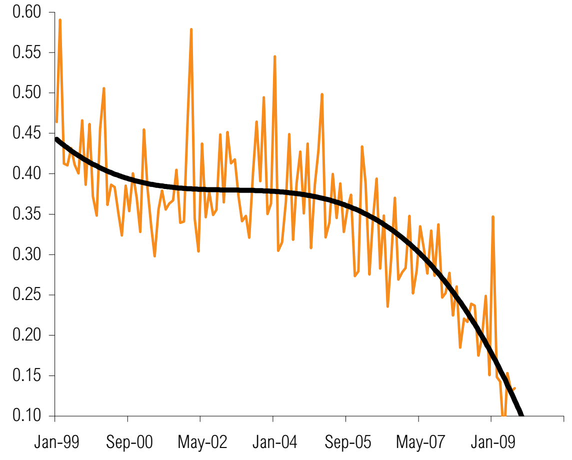
The following charts show that the seaborne iron ore trade has become an increasingly important source of iron for the Chinese steel industry. We believe this will not change dramatically because of the relative quality of imported iron ore and the longer-term drive for more efficient production in China's steel sector.

Monthly Chinese iron ore imports and production



Source: CEIC

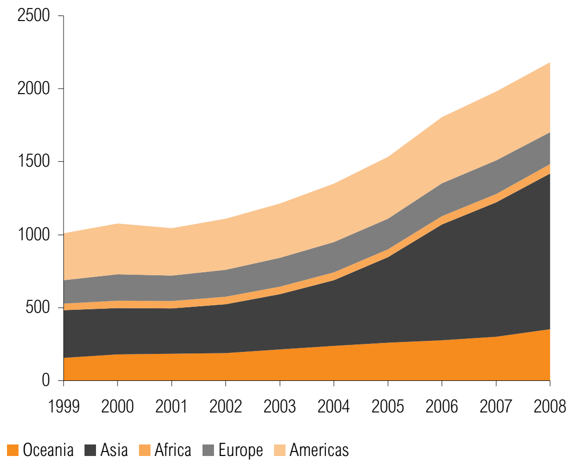
Implied domestic iron ore grade (Fe%)



Source: RBS estimates

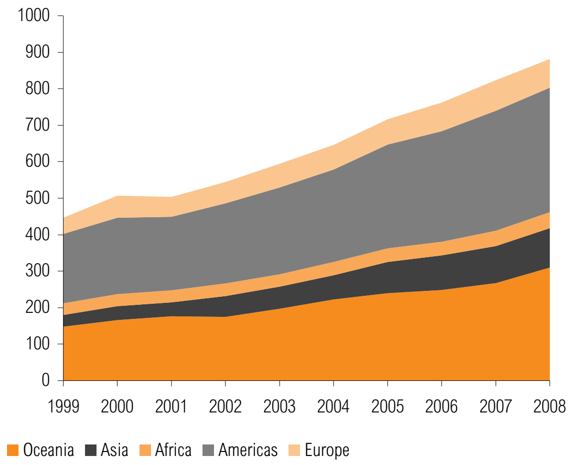
We are under no illusion that the implied grade of domestic iron ore shown in the preceding chart is accurate. The inability to capture the Chinese supply chain means our estimates do not take into account stock movements, so monthly or quarterly movements in the implied grade are unreliable. However, we believe the trend is indicative of the impact of mining lower-grade ores over time.

World iron ore production (Mt)



Source: UNCTAD

World iron ore exports (Mt)



Source: UNCTAD

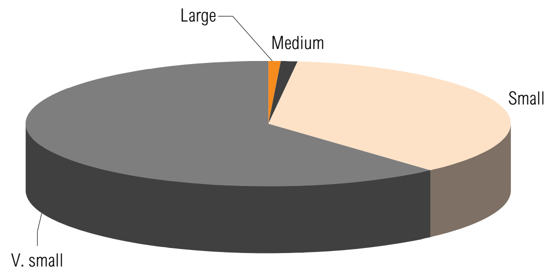
Data compiled by the United Nations Conference on Trade and Development (UNCTAD) indicates that about 50% of global production (on a grade-adjusted basis) makes its way into the seaborne market. The cost curves that follow account for about 50% of global production. In the compilation we have captured Australian, Brazilian and North American production, which accounts for about 75% of seaborne trade. The traditional cost curves of the major western producers and our slightly modified versions may explain some of the pricing dynamics of the seaborne market, but really do not capture the overall industry dynamic. The two big holes in our data are the Indian and Chinese iron ore industries. We can therefore understand why the major producers spend a lot of time attempting to come to grips with the production and cost dynamics of these two countries.

Our view is that the marginal cost of production in small Chinese mines is Rmb500-600/t, which could equate to an FOB equivalent of US95-110c/dmtu

Chinese domestic producer costs

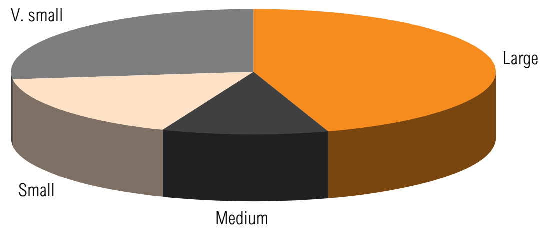
We believe the structure of the Chinese iron ore industry is an important contributor to the seaborne price because of the import of small, relatively lower-grade and higher-cost mines. Reliable statistics are again difficult to pin down. In our view, the absolute number of mines is probably not that important. What matters is that small mines contribute 25-30% of China's domestic production.

Chinese domestic mine distribution by size, 2008



Source: CEIC (Chinese Economic Information Center)

Chinese domestic mine distribution by production contribution, 2008



Source: CEIC

Further complicating the issue is the ability to judge the impact of price on supply. Getting a consistent pricing structure for domestic Chinese iron ore is somewhat problematic. Mysteel and Antaike publish provincial iron ore prices fairly regularly, but even after normalising for the specified iron content these are highly variable. Our investigation of the differences did not come up with a thorough explanation; however, it does appear that the price spread reflects (see table below):

The price spread appears to be far too large

- the distance between mines and steel mills (for example, many private steel mills in Hebei require iron ore to be transported from other areas);
- the level of integration or co-dependency of mines and mills;
- the moisture content (anecdotally iron ore in Shanxi Daixian tends to have a higher water content than that from other areas);
- the iron content; and
- the bargaining power of the non-integrated mines.

Chinese domestic iron concentrate prices

Province	Origin	Fe content		Moisture	Rmb/t excl VAT	Rmb/t incl VAT	US$/t incl VAT	US$/t excl VAT	US$/t incl VAT	US$/t excl VAT	USc/dmtu
Shanxi	Daixian	64%	Dry		479	560	82	70	82	70	109
Guangdong	Huaji	66%	Wet	6%	453	530	78	66	83	71	107
Shandong	Luzhong/Jinling	65%	Wet	6%	735	860	126	108	134	114	176
Liaoning	Beipiao	66%	Wet	6%	500	585	86	73	91	78	118
Liaoning	Gongchangling	65%	Wet	6%	495	579	85	72	90	77	119
Liaoning	Fushan	66%	Dry		564	660	97	83	97	83	125
Jilin	Tonghua	66%	Dry		568	665	97	83	97	83	126
Hubei	Daye	63%	Dry		564	660	97	83	97	83	131
Anhui	Fanchang	64%	Dry		641	750	110	94	110	94	147
Hebei	Tangshan	66%	Wet	6%	658	770	113	96	120	103	155
Hebei	Handan-Xingtai	66%	Dry		654	765	112	96	112	96	145

Source: Mysteel, RBS estimates

Chinese iron ore production is not grade adjusted and our analysis indicates that, at best, ROM grades have fallen to less than 30%

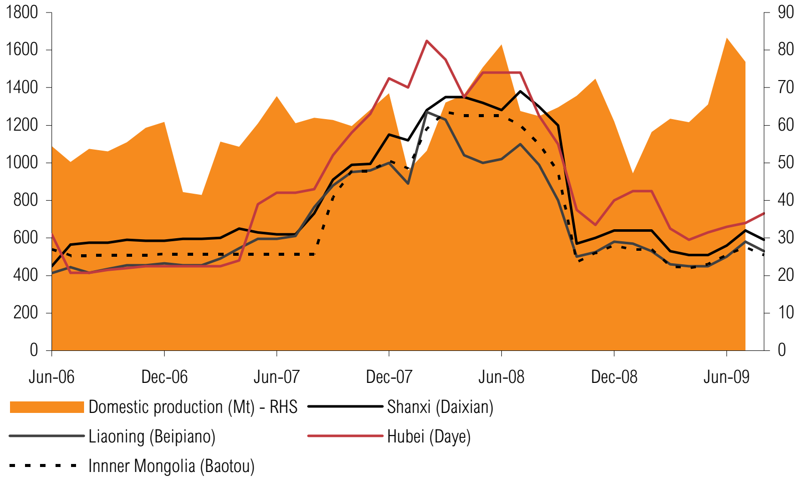
The tonnes added over the past six months may be substantially lower-grade

Our estimate of the marginal cost of production is done in reverse and is based on anecdotal evidence rather than on specific insights into the direct operating costs. In April and May of this year, the Xinhua news agency reported that up to 40% of mines in the northern provinces had been forced to close due to low prices. At the same time, the *Metal Bulletin* was quoting an un-named steel mill official who said “it costs miners 500-600 yuan (US$73-88) per tonne to produce iron ore, which suggests that more mines are likely to close”… when prices reach this level. Alternative pricing points appear to be when domestic iron ore prices fall below Rmb700/t (including VAT), and on RBS site visits we have heard that a number of mines require Rmb550-600/tonne to make profit.

The next chart indicates there is some relationship between the average price and disclosed production, but given the mixed levels of integration and transport distances, a firm assessment is difficult.

In summary, we believe the marginal cost of production in China is Rmb500-600/t, which could equate to an FOB of US95-110c/dmtu depending upon grade, moisture content, impurities, etc.

Chinese iron ore production (Mt, rhs) and regional prices (Rmb/t)



Source: CEIC, Bloomberg

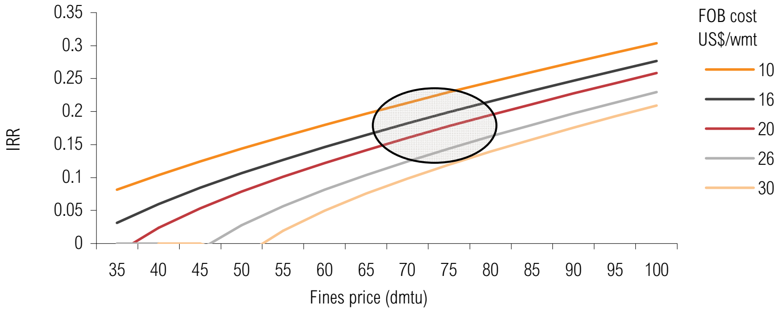
A look at incentive prices

We believe an incentive price for additional capacity is within the range of US65-75c/dmtu

We have traditionally used an incentive price methodology to determine our long-term price assumption for iron ore. This is because there is more data available from listed producers, and the growth in production capacity in Brazil and Australia was driven by the potential return to shareholders. However, we also took into account that new or additional developments by the major producers would be able to leverage off existing operations and may therefore have a lower investment hurdle.

There appears to be no hard and fast rule on internal rates of return on brownfields expansions – companies seem to have targets of 30%-plus returns, but our modelling of projects indicates this may be after taking into account relatively minor increments in capital and factors in shared benefits from existing capacity. In our modelling we assume a base capex per wet metric tonne of capacity of US$100/t, which seems to be a reasonable ballpark estimate for Australian capacity additions. In other less-developed countries this probably doesn't hold true. For example, our past modelling of the potential Simandou deposit in Guinea used a capital intensity of US$150/t, and this may have been on the low side when taking into account the amount of infrastructure required and the potential compensation payments. We believe an incentive price for additional capacity is within the range of US65-75c/dmtu.

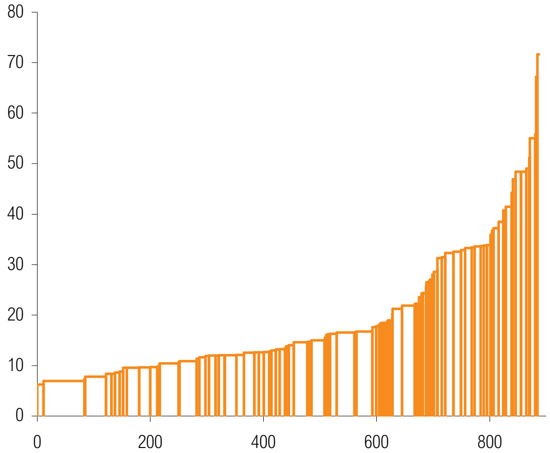
Internal rates of return for various iron ore prices and operating costs



Source: RBS estimates

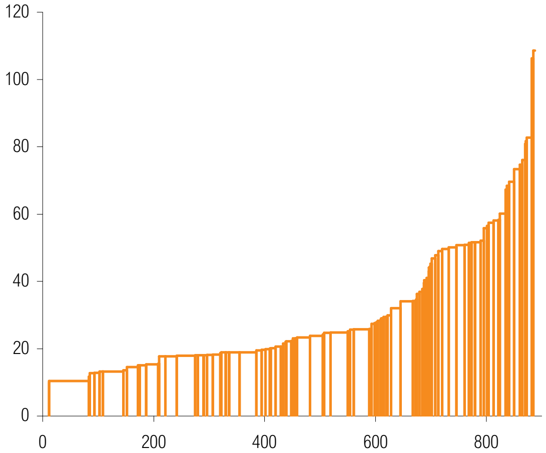
The range of US65-75c/dmtu sits at around the 90th percentile of the mine list we have compiled, but we believe it would move down somewhat were we to take into account the Chinese production that we have been unable to include because of the lack of information.

FOB iron ore cost (US$/wmt), 2009



Source: AME, CRU, BHP, RIO, FMG, RBS estimates

FOB cost (USc/dmtu), 2009



Source: AME, CRU, BHP, RIO, FMG, RBS estimates

And the winner is...

… foreign miners or the JV partners China needs to augment its supply of domestic iron ore production

LT fines price now US85c/dmtu

LT lump price now US100c/dmtu

Our long-term price

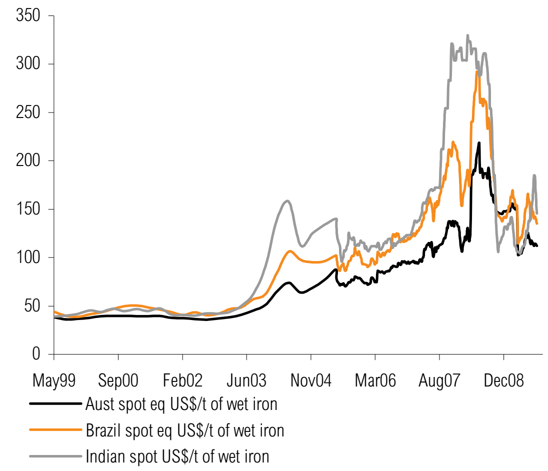
In summary, if we use the domestic marginal cost range of US95-110c/dmtu and the incentive price range of US65-75c/dmtu, and weight them based on Chinese production compared with the global production of iron ore, the weighted average price is US77c/dmtu. Alternatively, we would argue that, from here on out, China will play the lead role in global iron ore price setting because it is the largest steel producer, which implies its domestic production should justifiably play a more important role in the industry pricing dynamic. Using the import vs domestically sourced iron ore split (grade-adjusted) yields a weighted average price of US85c/dmtu for fines. For lump we use a relative price premium of US15c/dmtu, which exceeds the pre-2005 average of US9c/dmtu and is less than recent premiums of up to US57c/dmtu.

We believe China will play less of a role in pricing lump since it is predominantly a fines buyer, and that Japan and Korea will play more of a role in setting the differential. In addition, we believe the premium reflects not only the value in use, but also the relative scarcity of lump reserves. Our long-term lump price forecast is US100c/dmtu.

Shorter term – product substitution drives the spot price

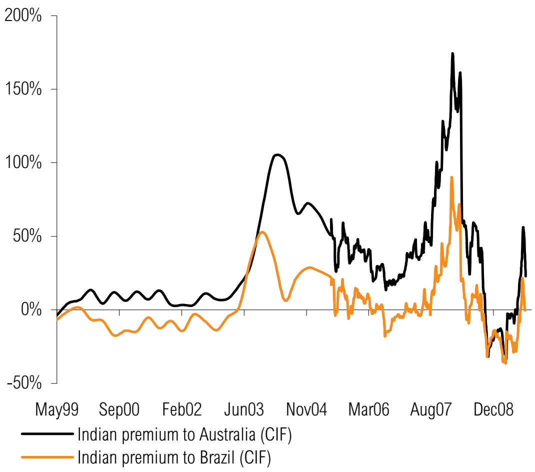
We believe the recent decline in the spot iron ore price reflects steel mills moving to protect operating margins in the face of steel price declines. The China steel industry's agreement to pay a provisional price for Australian and Brazilian ore, which we believe is similar to the benchmark price settled with other Asian steel makers, opened the door for a cheaper source of imports.

CIF price in China (US$/wmt)



Source: RBS estimates, Reuters

India premium to Australia and Brazil (landed China)

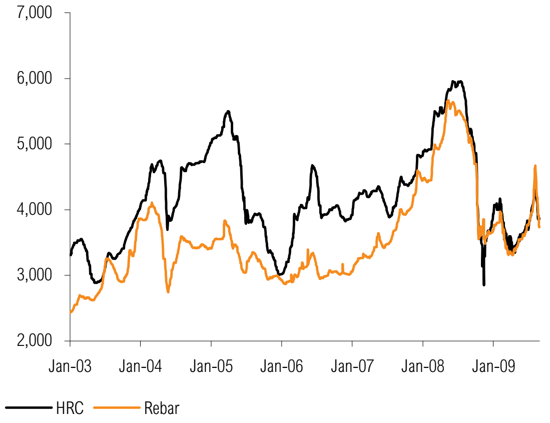


Source: RBS estimates, Reuters

New facilities still slated for start-up by large steel makers (eg Angang's Bayuquan second blast furnace, Shougang's Caofeidian project) should support iron ore demand

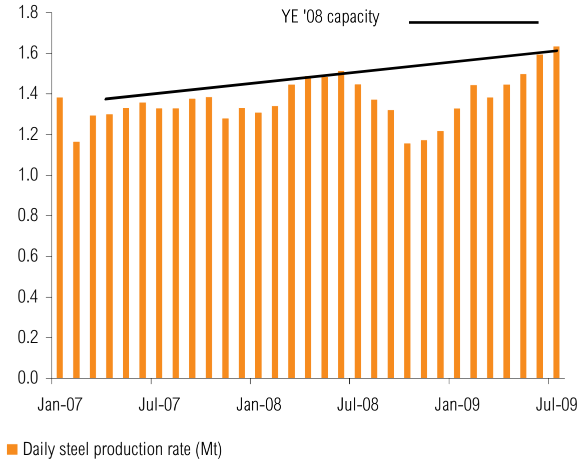
We believe it will take time to curb Chinese steel production, even if the government wants it reduced, and iron ore demand may not fall precipitously. Limited production cuts by the Chinese steel industry are a major concern; the excess supply may continue to put a cap on, or lead to more volatility in, steel prices. The Chinese government's stimulus package will need to lift demand for steel further than the 2.7% yoy increase seen for the first four months of the year. In the end, we may only need a 6% increase in steel product output and consumption to see local crude steel production fall into line with domestic demand.

Chinese steel prices – steel prices under pressure and iron ore demand strong



Source: Bloomberg

Chinese steel production rate



Source: CEIC

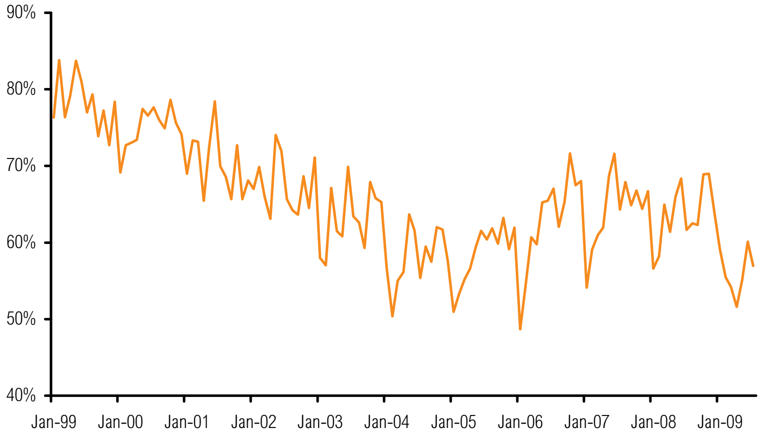
We do not expect the Chinese government's measures to have much impact on the demand-supply balance in China over the next two to three years

We expect to see relatively good import numbers for iron ore into China over 2009, despite some possible moderation in the second half. China's State Council has indicated it would study curbs on overcapacity in industries, including steel and cement, to ensure there is no excessive investment. The measures that might be taken include limiting project approvals, raising environmental requirements and tighter lending standards. Nevertheless, we do not believe the government will be able to turn off a lot of steel production capacity in the short term while the push for GDP growth continues.

Over that time, what is more important is the pace of demand recovery to absorb the current excesses

We also expect to see Chinese iron ore production reverse its recent upward trend and reflect the volatility in steel prices. We do believe the Chinese steel producers and traders will have to take their foot off the import pedal at some stage. The positive for Australia and Brazil is that ore priced on a provisional basis is more competitive than spot Indian ore on a landed basis, particularly with the recent decline in freight rates.

Percentage of iron ore domestically sourced in China

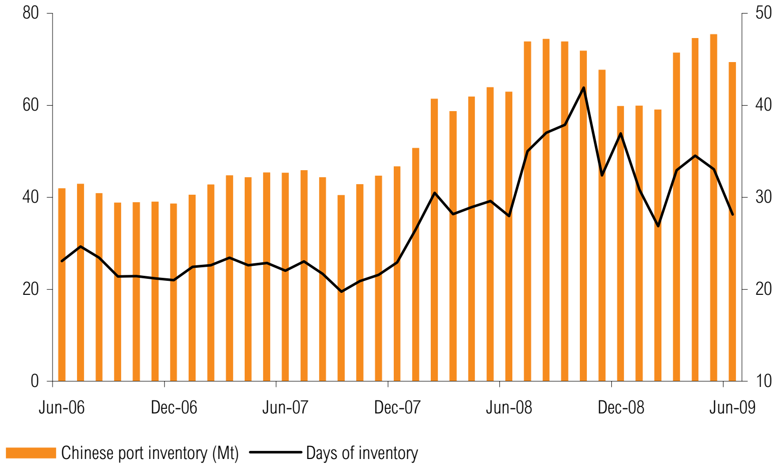


Source: CEIC

Stocks not an issue while steel production continues

China's iron ore imports should therefore remain relatively robust in the medium term due to falling domestic production and a levelling out of steel production growth. We believe it is fair to say that no one really knows where the Chinese market is in terms of restocking. However, it does appear that the supply chain in China is now coping with the outload requirements and that port stocks have stabilised, allowing for a reduction in port congestion and effectively freeing up the cape market, thus leading to lower freight rates.

China's port stocks not an issue based on step production rate



Source: CEIC, RBS estimates

What is potentially more important for the iron ore outlook is the level of steel stocks the Chinese end up with in 2010, which in turn will influence the relative bargaining position of industry participants. It seems reasonable to us to infer that the rapid increase in output by Chinese steel producers may have outpaced the current demand recovery. In recent weeks, Chinese steel prices have fallen about 25% from the peak, on stock builds and the potential for the government to take some action against traders to curb excess, which we believe will lead to a softening in 2H09 demand through the product chain.

We do believe the Chinese government will instigate stricter control of future capacity additions, which would be a positive for the industry, in our view, particularly if future new capacity additions can be controlled. However, it remains to be seen how successful such curbs might be. Since 2005, when China first became a net exporter of steel, it has been a stated objective of the government that inefficient capacity should be reduced and that industry structure should be improved. Since then, capacity increases have continued (albeit not all are inefficient) and several provinces have undertaken restructuring with the objective of increasing their capacity overall in the long term.

We believe the supply-demand imbalance is small enough to be removed, with minor changes in Chinese domestic supply

It is in the buyer's interest to ensure that capacity additions do occur in the future to avoid a recurrence of the 2008 spike

In summary, we forecast a marginal under-utilisation of iron ore production capacity over the next four years. However, the implied supply-demand imbalance should be small enough to be removed, with minor changes in Chinese domestic supply. The wildcards we see for reduced export capacity are: 1) India, where the government indicates that it intends to preserve iron ore for its domestic steel industry; and 2) the lasting impact of the global financial crisis, which has seen majors halt expansions and junior producers struggle to fund capital expenditure. From an iron-ore-demand perspective, we see the potential for Chinese steel producers to reduce their reliance upon domestic ore.

Iron ore price forecasts (FOB Australia)

Year-end: 31 March	2007A	2008A	2009A	2010A	2011F	2012F	2013F	2014F	2015F	LT
Fines – USc/dltu	**74.64**	**81.73**	**146.98**	**98.56**	**108.41**	**116.54**	**104.89**	**94.40**	**80.24**	**86.36**
- USc/dmtu	73.46	80.44	144.67	97.00	106.70	114.71	103.24	92.91	78.98	85.00
- US$/t @ 62%Fe/7% moisture	42.4	46.4	83.4	55.9	61.5	66.1	59.5	53.6	45.5	49.0
% change yoy	**19.0%**	**9.5%**	**79.9%**	**-32.9%**	**10.0%**	**7.5%**	**-10.0%**	**-10.0%**	**-15.0%**	**7.6%**
% change from previous forecast	-	-	-	0%	5%	5%	5%	11%	18%	33%
Lump – USc/dltu	**95.25**	**104.29**	**204.94**	**113.80**	**125.18**	**134.57**	**124.47**	**112.03**	**95.22**	**101.60**
- USc/dmtu	93.75	102.65	201.71	112.01	123.21	132.45	122.51	110.26	93.72	100.00
- US$/t @ 62%Fe/4% moisture	55.8	61.1	120.1	66.7	73.3	78.8	72.9	65.6	55.8	59.5
% change yoy	**19.0%**	**9.5%**	**96.5%**	**-44.5%**	**10.0%**	**7.5%**	**-7.5%**	**-10.0%**	**-15.0%**	**6.7%**
% change from previous forecast	-	-	-	0%	-2%	-2%	3%	10%	22%	0%

Source: TEX, RBS forecasts

World iron ore supply-demand balance – 2005-15F

(Mt)	2005E	2006E	2007E	2008E	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Total iron ore production	**1,544**	**1,781**	**1,991**	**2,122**	**2,120**	**2,235**	**2,337**	**2,454**	**2,509**	**2,537**	**2,552**
% change	15.8%	15.4%	11.8%	6.6%	-0.1%	5.4%	4.6%	5.0%	2.3%	1.1%	0.6%
Total steel production	1,104	1,216	1,317	1,302	1,230	1,323	1,393	1,469	1,552	1,641	1,737
% change	6.5%	10.2%	8.3%	-1.2%	-5.5%	7.6%	5.3%	5.5%	5.6%	5.7%	5.9%
Chinese steel production	348	421	487	498	527	595	642	700	763	832	906
% change	26.9%	21.1%	15.6%	2.2%	5.9%	12.8%	8.0%	9.0%	9.0%	9.0%	9.0%
% of total	31.5%	34.6%	37.0%	38.3%	42.8%	44.9%	46.1%	47.6%	49.2%	50.7%	52.2%
Total steel production from iron ore (primary)	**751**	**826**	**909**	**898**	**849**	**906**	**954**	**1,007**	**1,063**	**1,124**	**1,190**
% change	9.7%	10.0%	10.0%	-1.2%	-5.5%	6.8%	5.3%	5.5%	5.6%	5.7%	5.9%
Total iron ore demand	**1,549**	**1,789**	**2,024**	**2,091**	**2,055**	**2,202**	**2,305**	**2,402**	**2,477**	**2,589**	**2,709**
% change	15.5%	15.5%	13.2%	3.3%	-1.7%	7.2%	4.7%	4.2%	3.1%	4.5%	4.7%
Supply-demand balance	**-5**	**-7**	**-33**	**31**	**65**	**33**	**32**	**52**	**32**	**-52**	**-157**
Avg iron ore price change	71.5%	19.0%	9.5%	96.5%	-44.5%	10.0%	7.5%	-7.5%	-10.0%	0.0%	0.0%

Source: IISI, TEX, RBS forecasts

Coal

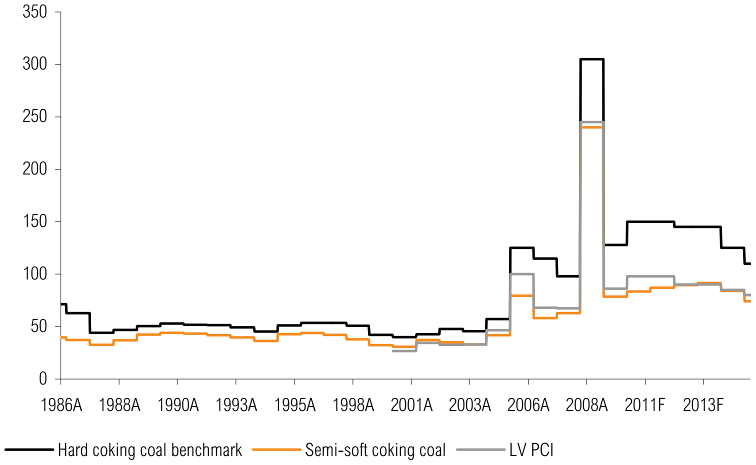
Warren Edney, Australia
Senior Mining Analyst
warren.edney@rbs.com
+613 9612 1557

RBS Australian mining team

No return to previous price lows

We have upgraded our long-term and short-term coal prices. Long-term prices have increased 14-27% to reflect what we believe will be a longer-term effect of production costs on prices. An improvement in demand has seen our short-term prices increase 5-15%, with China consuming the spare tonnage.

Metallurgical coal prices (US$/t)



Source: TEX, RBS forecasts

Broad pricing spectrum

The thermal coal market is suffering from arbitrage pricing. China is now in the driver's seat for coal, its move to increase imports having taken up the slack in the market. After the recovery in demand for thermal coal the spot market has eased back and is now being driven by the pricing of Chinese domestic coal relative to low-grade Indonesian coal or Australian/South African product. We do not see this changing in the short term.

Metallurgical coal prices are benefitting from a tight market

The 20mt turnaround in metallurgical imports into China was enough to rapidly tighten the market for that product, which had already braced itself for a dramatic decline in Asian and European demand by factoring in capacity reductions.

Long-term coal up to offset costs

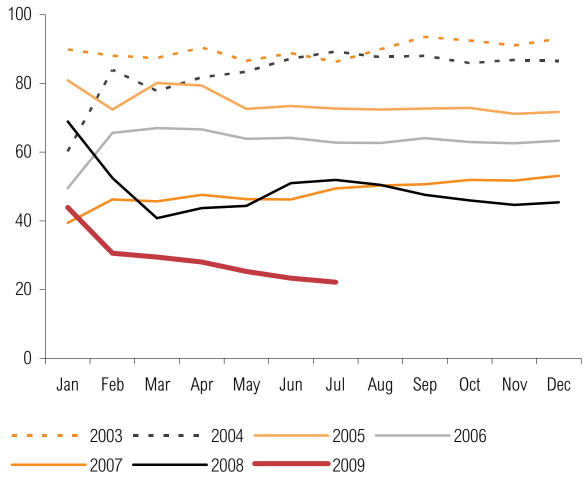
We have changed our view about potential cost reductions in the Australian coal sector and believe cost pressures will also be felt by the Chinese coal industry, which could lead to China's ongoing participation in the seaborne coal market as a buyer. We believe these factors are likely to be reflected in long-term metallurgical coal prices, and we expect the thermal coal market to benefit from the impact of lower than previously anticipated export tonnes and poorer-quality coal out of Indonesia, offsetting cost pressures.

China to the rescue

The current market for coal

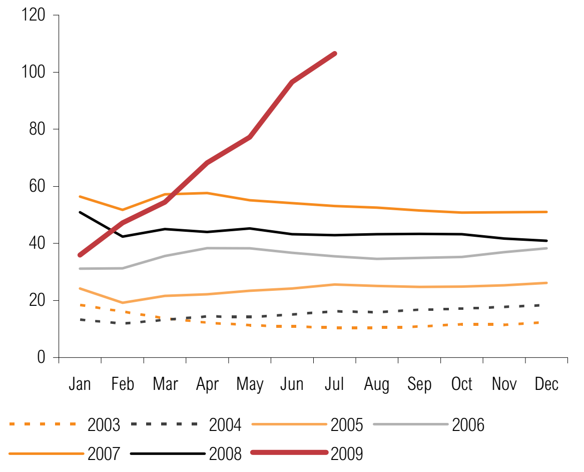
Since coal prices settled in 2Q09, the market's dynamics have continued to improve, with the seaborne metallurgical coal markets becoming tight and thermal coal demand up, albeit largely price-sensitive. Recent trade press indicates producers and coal traders alike are now seeing China as a much more active market participant in term contract negotiations and as an ongoing spot buyer of coking coal (if available). We believe that, for a number of reasons, this situation will continue into the future and could be augmented by growth in Indian demand.

Monthly Chinese coal exports (annualised, Mt)



Source: CEIC

Monthly Chinese coal imports (annualised, Mt)



Source: CEIC

China's move into the import market appears to have frightened other Asian consumers, prompting them to lock in tonnes and leading to the rally in prices

We do not believe that the reduction in Chinese exports is a one-off or that imports will fall back below 2007 or 2008 tonnages. We expect restructuring of the Chinese coal sector to continue, as safety concerns and the desire to improve efficiency drive greater share to large producers. Coal production costs are rising, with policy-related imposts being a key driver for sustainably higher prices. China could also increase imports on a structural basis, as domestic coal grades decline. In our view, policy action will support domestic prices, while the increase in imports could have a major effect on the seaborne coal market.

Thermal coal – still a buyer's market

We believe recent weakening in spot Australian coal resulted from a move by buyers to purchase discounted, lower-quality Indonesian coal and is reflected in reduced August imports

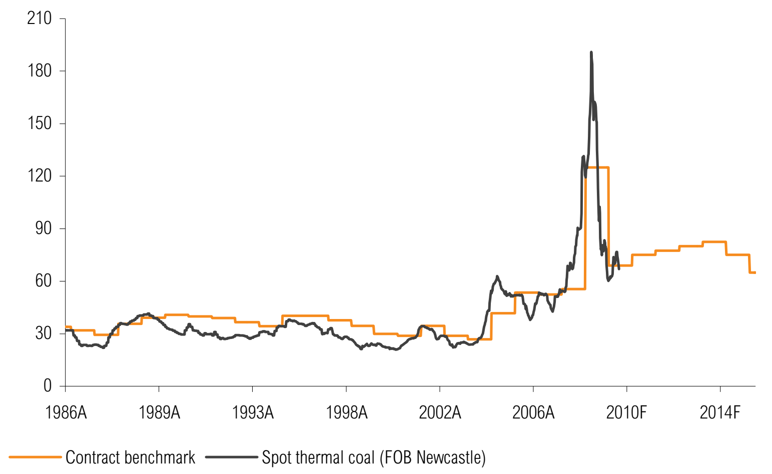
Indonesian exports could have peaked in the third quarter, while the rainy season in the fourth quarter could see spot prices improve

Spot market weak – contract market better than in early 2009

The JFY09-10 thermal coal price settlement of about US$69/t (basis FOB Newcastle) came at a time when Asian consumers were cutting back on power generation. Since then, Asian growth appears to have bottomed, and a decline in freight rates and import demand saw China move into the spot market as a means of picking up more competitively priced imported coal, with prices reaching US$77/t. This enabled Xstrata to go into its June 2009 to June 2010 and October 2009 to September 2010 negotiations with Japanese power utilities with a more positive bias on pricing. It now appears Chubu has settled at US$74-75/t. This was less than the initial US$78-79/t and reflects the weaker spot market for Australian coal, now around mid-US$60/t.

It does appear that US$60/t for thermal has become the price point for Chinese buying of Australian and South African thermal coal following the weakening in freight rates.

Thermal coal – FOB Newcastle (US$/t)



Source: Bloomberg, RBS forecasts

The Chinese and Koreans are predominantly taking more low-energy coal from Indonesia following its recent record production levels. The Indonesian producers appear to be flooding the market in order to reduce stocks and are pricing 5,000kcal/kg coal at US$51-53/t FOB, which is a US$5/t discount to Newcastle on an energy-equivalent basis. At these sorts of prices, including 17% VAT, Indonesian coal is US$3-5/t cheaper on a landed basis than Chinese domestic coal. In the short term it therefore appears that demand for Australian coal will probably be more for its use as a blending coal to improve the quality specifications of coal sourced elsewhere.

Changes to thermal coal price forecasts (FOB Australia)

(US$/t, year-end: 31 March)	2007	2008	2009	2010	2011F	2012F	2013F	2014F	2015F	LT
Thermal										
Current	**52.5**	**55.5**	**125.0**	**69.0**	**75.0**	**77.5**	**80.0**	**82.5**	**75.0**	**65.0**
Previous	52.5	55.5	125.0	69.0	70.0	75.0	80.0	82.5	85.0	55.0
Change	0.0	0.0	0.0	0.0	5.0	2.5	0.0	0.0	-10.0	10.0
Change	0%	0%	0%	0%	7%	3%	0%	0%	-12%	18%

Source: TEX, company data, RBS forecasts

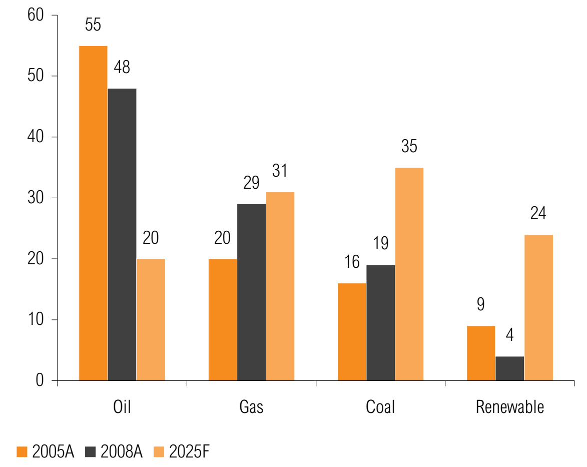
Indonesia's impact on the seaborne market likely to diminish, in our view

Over the next two to three years we believe the dynamics of the thermal coal market will change, with a reduction in the export potential of Indonesia and a potential increase in India's imports. As Indonesia embarks on a more aggressive build-out of power capacity, we expect incremental coal output to go towards domestic demand rather than exports.

Indonesian coal output expansion plans may also fall short of expectations, with much of the country's slated growth to come from lower calorific value coal, which is less attractive to importers

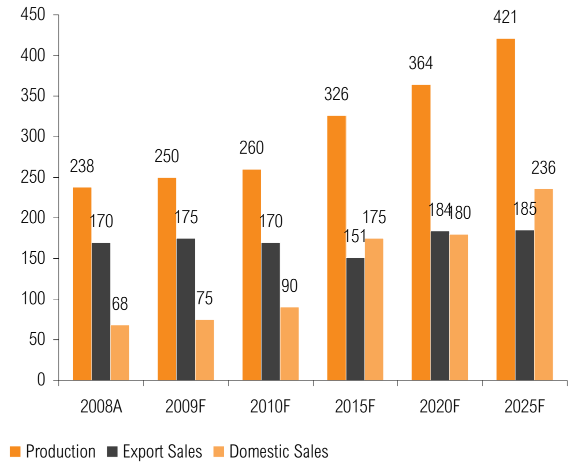
The Indonesian coal producers have aggressive plans to expand output, but the Indonesian Coal Mining Association has less optimistic projections about the pace of such additions. We also believe capacity expansion may be slower than our previous expectations. As a result, we expect little change in the volume of coal exports from the largest supplier of thermal coal to the export market. We also note that much of the planned volume growth in Indonesia is in lower calorific value coal, which is likely to be less attractive to importers.

Indonesia's energy mix shifting towards coal (% total)



Source: Ministry of Energy & Mineral Resources

Indonesia's coal demand-supply forecasts (m tonnes)



Source: Indonesia Coal Mining Association

India's investment in infrastructure is also increasing and, in the government's latest budget, spending on power plants was projected to increase 45% yoy

India is also stepping up its investment in infrastructure, including power plants. In the Indian government's latest budget, spending on power plants was projected to increase 45% yoy, a step up from the 14-22% annual growth we have seen within the past few years. However, coal production in India has not kept pace with this growth, resulting in a rising need for imports, which we believe are likely to exceed previous government projections of 61Mt by FY12.

This probably leaves Australia as a marginal exporter of coal, which, in turn, would necessitate new mine developments and infrastructure builds that, at present, continue to be postponed (see our previous comments on Australian infrastructure). We also see potential for even more problematic growth options, such as the development of the Mongolian coal deposits, which, although they are land-locked, could supply demand growth in China, thereby allowing China to resume its place as a supplier of coal into the Asian market.

Metallurgical coal (coking coal)

Supply appears set to remain constrained in the second half of 2009, which should support price outcomes in 2010

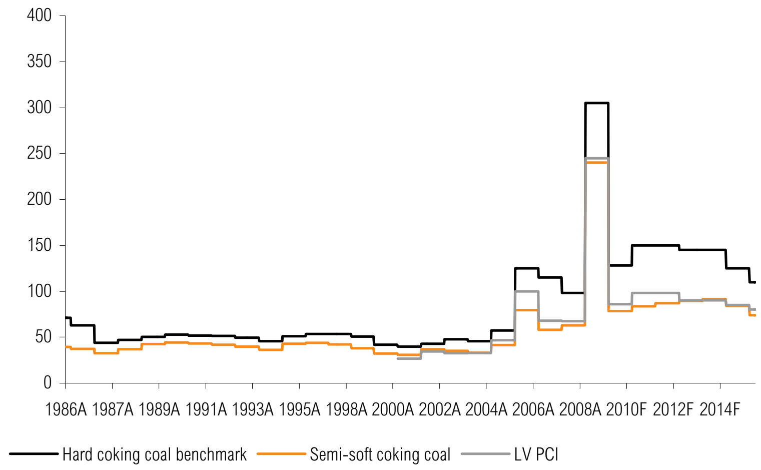
Benchmark prices for metallurgical coal for JFY09-10 were settled at US$128/t for premium hard coking coal, US$86/t for LV PCI coal and US$78.50/t for semi-soft coking coal. As with thermal coal (albeit in a more opaque manner), it appears the increase in Chinese steel production, and therefore in flat Asian steel production, has led to a tightening in metallurgical coal markets. The curtailment of production increases, coupled with rail constraints, have had a positive effect on prices.

Changes to metallurgical coal price forecasts (FOB Australia)

(US$/t, year-end: 31 March)	2007A	2008A	2009A	2010A	2011F	2012F	2013F	2014F	2015F	LT
Hard coking coal										
Current	**115.0**	**98.0**	**305.0**	**128.0**	**150.0**	**150.0**	**145.0**	**145.0**	**125.0**	**100.0**
Previous	115.0	98.0	305.0	128.0	130.0	135.0	130.0	137.5	145.0	86.5
Change	0.0	0.0	0.0	0.0	20.0	15.0	15.0	7.5	-20.0	13.5
Change	0%	0%	0%	0%	15%	11%	12%	5%	-14%	16%
Semi-soft coking coal										
Current	**58.0**	**63.0**	**240.0**	**78.5**	**83.5**	**87.0**	**91.5**	**84.0**	**74.0**	**74.0**
Previous	58.0	63.0	240.0	78.5	80.5	84.5	89.5	91.8	94.0	62.5
Change	0.0	0.0	0.0	0.0	3.0	2.5	2.0	-7.8	-20.0	11.5
Change	0%	0%	0%	0%	4%	3%	2%	-8%	-21%	18%
LV PCI coal										
Current	**68.0**	**67.5**	**245.0**	**86.0**	**98.0**	**98.0**	**90.0**	**90.0**	**85.0**	**80.0**
Previous	68.0	67.5	245.0	86.0	88.0	92.5	90.0	90.0	90.0	70.0
Change	0.0	0.0	0.0	0.0	10.0	5.5	0.0	0.0	-5.0	10.0
Change	0%	0%	0%	0%	11%	6%	0%	0%	-6%	14%

Source: TEX, company data, RBS forecasts

Metallurgical coal benchmarks (US$/t FOB)



Source: TEX, Wood Mackenzie, company data, RBS forecasts

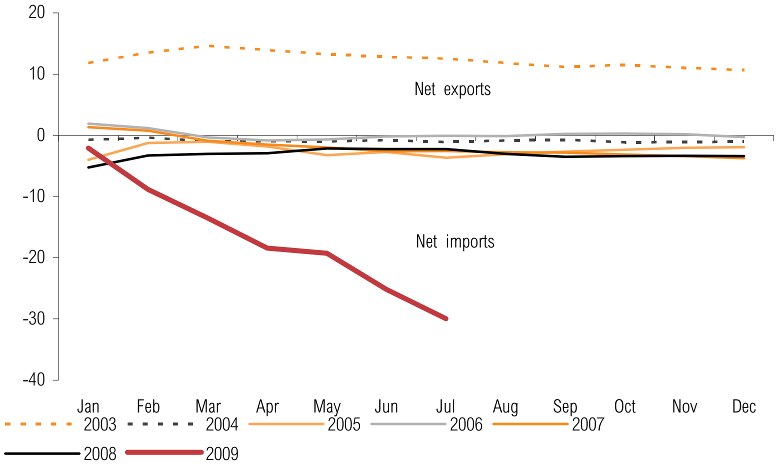
China and India, not Japan and Korea, the key to the future

Chinese buying – subject to price – is probably here to stay, with anecdotal evidence of buying interest from the Chinese beyond 2009 and into 2010

China has moved from being a small net importer of coking coal (less than 5Mtpa over the past five years) to a position in July of annualised net imports (exports minus imports) running at 30Mtpa. While 30Mtpa may not be much in global production terms, it was the 25Mtpa increase over six months that led to a rapid tightening in the coking coal market.

We believe the import rate could ease for the balance of 2009 on the back of weakening steel prices, but the strength of the domestic coking coal price in China, combined with the country's record steel production, certainly do not suggest a collapse in demand for seaborne metallurgical coal.

Chinese monthly coking coal trade (annualised, Mt)



Source: CEIC

“In addition, India has been attracting a lot of investment into its steel industry, with many domestic and global producers having announced plans to set up large steel projects, drawn by the country’s abundance of iron ore. These plans have been delayed by the long approval process, and this has been exacerbated by the financial crisis. However, when these projects eventually get off the ground, India’s need for imported coking coal will rise. Based on the Ministry of Steel’s projections under the 11th Five-Year plan (FY08-12), India’s imported coking coal needs will rise to 45Mt from 23Mt in FY07.” – excerpt from ‘*Basic Elements – Coal roads lead to Asia*’, published 9 September 2009 by RBS Metals and Mining analyst in Hong Kong, Jeannette Sim.

India's projected coal imports set to rise by to 105.4mt by 2012F

(Mt)	FY08	FY09	FY10	FY11	FY12
Thermal coal	39.0	34.6	42.0	52.6	60.7
Coking coal	20.7	23.4	32.0	41.4	44.7
Total	**59.7**	**58.0**	**74.0**	**94.0**	**105.4**

Source: Report of the Working Group for the 11th Five-Year plan

Hard coking coal market tight

Spot prices for hard coking coal now appear to be US$165-175/t FOB Queensland, up from US$140-145/t in July

Comments by Australian producers and trade press indicate that 2H09 spot sales outcomes may now be based on being able to source spot tonnages of premium hard coking coal rather than the price paid. Metallurgical coal supply, particularly out of Queensland, is being hampered by rail performance and some constraints at mine sites. Sites scaled back with the weakening market in 2008 and now lack some flexibility in mining, and hence in their ability to blend coals to meet typical product specifications for long-term customers. It appears that many mines sacrificed maintaining flexibility in their mining schedules in favour of selling everything they could (into spot demand) in the first half. This could see the market tighten even further in the second half if demand remains at current levels.

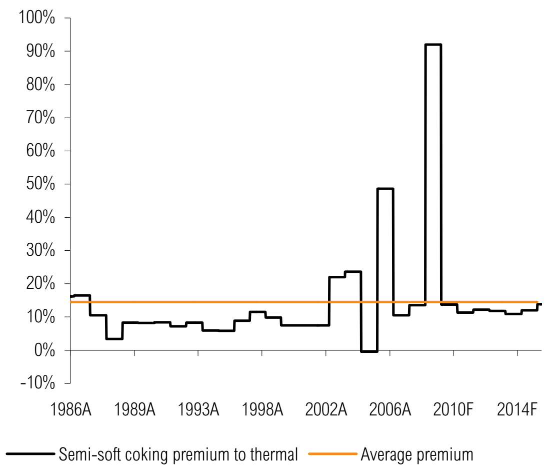
We believe freight markets and the treatment of carry-over will play a big part in negotiations for delivery in 2009 and beyond. For example, there is a big spread in the market pricing of hard coking coal, ranging from US$115 to US$175/t. However, the lower figure does not reflect a weakening market.

Platt's reported that SAIL had negotiated a price of US$115/t on new cargoes as long as it accepts cargoes of coal at the carryover price as well – that is, three cargoes at US$330/t and one at US$115/t results in an average price of US$257/t. It appears to us that SAIL is paying a price to maintain relationships and secure future tonnage.

Semi soft appeared very soft in 1H09

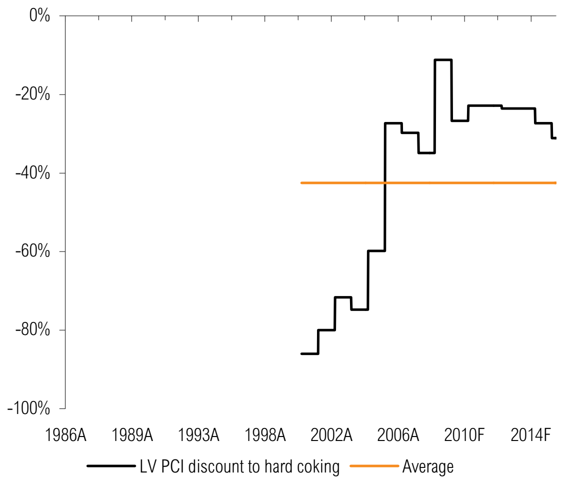
Since the downturn, the semi-soft market appears to have recovered the least with the improvement in steel capacity utilisation. Rio Tinto's semi-soft production was running at an annualised rate of 1.8Mt in 2Q09 vs 3.4Mtpa in 2Q08. However, it appears that Brazilian, European and Japanese steel mills have re-entered the semi-soft market since mid-year (based on Newcastle shipments in July and August). We believe this reflects a slight improvement in steel capacity utilisation rates and a move by consumers to minimise costs and replenish some stocks. Backing up this view are comments by Felix Resources that it has now entered into contracts with various Chinese steel mills to supply semi-soft coking coal from Ashton and that it is now sold out for the 2009/10 contract period.

Semi-soft coking coal premium to thermal coal



Source: TEX, RBS forecasts

LV PCI discount to premium hard coking coal



Source: TEX, company data, RBS forecasts

Platt's reports spot prices of US$97-98/t FOB QLD

Western Canadian Coal's president indicated Canadian producers are now considering boosting production to meet contract commitments that they thought would not be honoured

Swinging Pulverised Coal Injection (PCI) dynamics

The late-2008 hiatus in demand illustrated the sensitivity of PCI's pricing dynamics, in our view. When steel demand is high, steel mills tend to be less concerned about input prices, favouring premium-quality coking coal for coke production, supplemented by injecting PCI coal into the blast furnace to maximise coke strength and cost efficiency. This drives premium prices for higher-quality coking coals and for PCI for its value in use as an effective coke substitute. It also builds price linkage between the two products. Recent pricing dynamics illustrate this point. In June, LV PCI prices were in the mid-US$70s/t range, and with the rise in hard coking coal they were above US$145/t in July; August indicative LV PCI prices have risen to the high US$90s/t.

When steel demand is low, steel makers will sacrifice efficiency in favour of minimising costs. Carbon loading in the furnace can typically be maintained, but the operators tend to tolerate higher levels of volatile matter. So blast furnaces and coke ovens are still being run, lower grades of coking coal (for example, semi-soft) are usually substituted for premium brands and the loading of PCI is reduced in the furnace. Under this scenario, PCI is priced on an energy-adjusted basis relative to thermal coal, as evolved in early 2009.

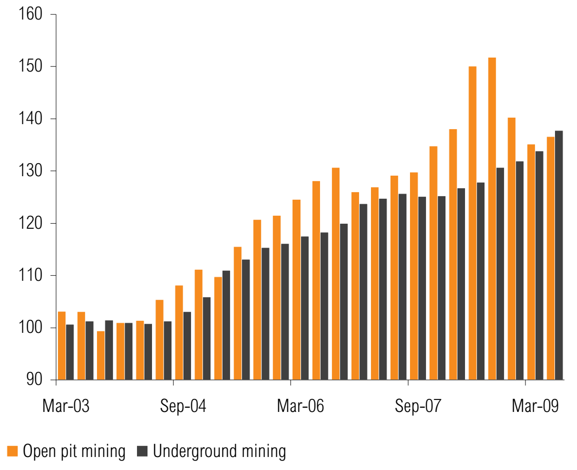
Steel-making margins may be capped while underutilised steel capacity is re-instated, but we believe the link between PCI and hard coking coal prices is reverting to levels last seen after 2006 (that is, PCI at a 25-30% discount to premium hard coking coal) as the stronger segments of the steel industry seem prepared to bid up prices for higher-quality coals. The difference this time is that China and India appear to be the drivers, rather than the traditional customers in Asia and Europe, at least so far.

Long-term coal prices need to rise as cost pressures increase

Our long-term assumptions increase to equivalent A$ prices of A$139/t for coking and A$97/t for thermal coal

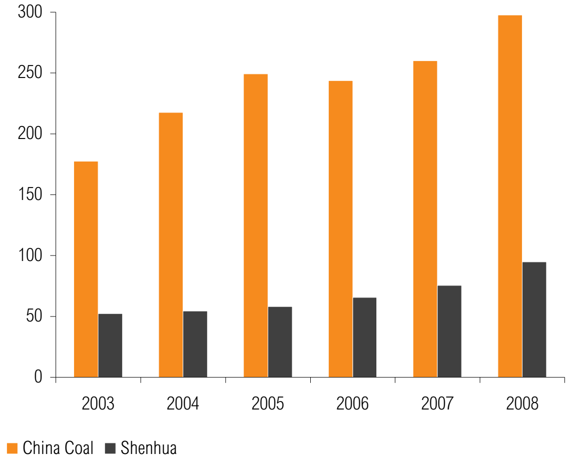
We are increasing our long-term coal price assumptions in line with our view that production costs are either continuing to escalate or are, at best, stabilising at a higher level than we had anticipated. We have modelled the long-term prices required to justify the development of the marginal tonne of capacity. As examples, this may represent the nominal high-cost QLD underground coking mine (eg Eagle Downs) and the thermal coal mines in the Surat Basin (eg Wandoan), which are low-strip but disadvantaged by haulage distances to the coast, and currently contingent upon new rail and port developments.

Australian coal mining cost indices



Source: ABS

China Coal and Shenhua's unit production costs (Rmb/t)



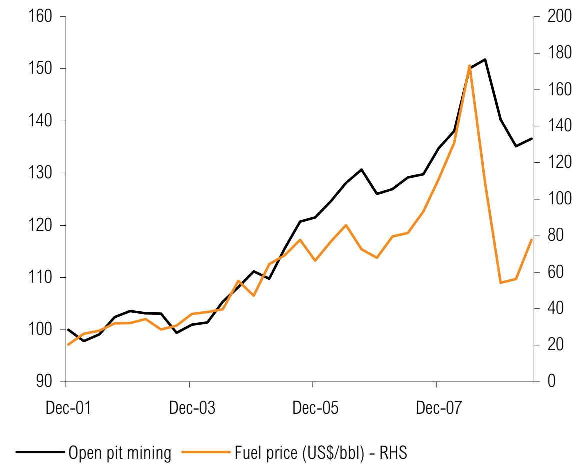
Source: Company data

Costs are not coming off as we had expected

In Australia, the Australian Bureau of Statistics (ABS) indices of costs in coal mining (see preceding chart at left) show that prices have been stickier than we expected. We have graphed the open-pit cost index vs the fuel price, which we estimate reflects the increase in fuel costs for trucking and other mobile equipment. We have also shown the correlation of open-pit costs with the rolling quarterly average of the Queensland electricity pool price, which may indicate the effect of power prices on dragline operations and washing. However, both of these energy inputs have come off their highs and are back at 2005 levels – with no corresponding reset of underlying operating costs.

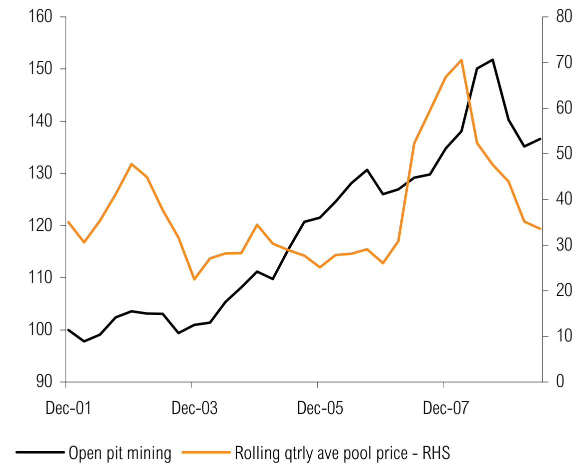
We interpret the limited decline in the latter as a reflection of a permanent upward shift in the cost of open-pit mining due to issues such as increased strip ratios and higher labour costs, although an eventual decline in explosives, consumables and labour costs could see costs fall somewhat.

Australian open-pit coal mining cost index and fuel price (US$/bbl)



Source: ABS, Bloomberg

Australian open-pit mining cost index vs the electricity price (average Queensland pool) (A$/Mwh)



Source: ABS, NEMMCO

Policy costs have been a factor in raising the overall cost of Chinese coal production...

In China, we believe policy (compliance) costs will support long-term coal pricing. To ensure better use of domestic coal, various local governments have imposed taxes on coal producers. For example, Shanxi province introduced three taxes in 2007 that added Rmb20-30/t to coal production costs. In addition, a change in resource taxes has been widely expected by the industry, from the current fixed Rmb3.3/t to an ad valorem tax. However, the exact quantum of this has yet to be determined, and the timing of its implementation remains uncertain.

... while mining costs may rise over time, as we believe the more accessible reserves are likely to have been found and mined already

We believe Chinese mining costs will also rise over the longer term as the more accessible reserves are likely to have already been found and mined. We have charted how coal production costs have been gradually rising in China. Many of the country's recent coal discoveries have been in Inner Mongolia or Xinjiang; transporting this coal to coastal areas will result in additional costs given the long distances involved and the supporting infrastructure that must be built.

Much of China's total 493Mt supply is sourced domestically from small-scale producers, and we believe these largely underground operations are being squeezed on costs by increasing mining depth and by the application of safety and environmental standards. The Chinese swing factor can impart a significant influence on market prices; however, if domestic supply is under pressure at the small end, then the effect may become more prominent in the longer term, helping to support a higher floor under long-term pricing.

On this basis, we have reviewed our incentive price for coal production after factoring in alternative supply sources and higher production costs, and we have increased our long-term price assumptions.

- Our thermal coal price rises from US$55/t to US$65/t.
- Our premium hard coking coal price rises from US$85/t to US$100/t (the biggest percentage change because of greater capital intensity, increasing strip ratios and the underground component).
- Semi-soft increases from US$62.5/t to US$74.0/t (a similar percentage to thermal).
- LV PCI rises from US$70 to US$80/t (with potential for further upside).

Supply-demand assumptions for seaborne thermal coal (mt)

	2005	2006	2007	2008	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Imports											
Japan	118	115	121	124	120	116	119	121	123	126	128
South Korea	57	60	66	74	78	84	91	98	106	114	123
Taiwan	53	54	56	53	53	54	55	57	60	61	61
China	19	33	45	54	59	65	71	75	79	82	87
Hong Kong	11	11	11	11	11	11	11	11	11	11	11
Israel	13	13	14	14	14	14	14	14	14	14	14
Malaysia	10	12	13	14	15	17	17	18	19	20	21
India	18	24	27	35	40	44	49	54	55	56	57
Other	21	23	25	27	28	29	31	32	34	36	37
Asia	**320**	**344**	**378**	**405**	**418**	**434**	**457**	**480**	**501**	**520**	**540**
Europe	**195**	**204**	**198**	**200**	**200**	**202**	**207**	**213**	**218**	**224**	**230**
Canada	17	16	17	17	17	17	17	17	17	17	16
US	26	31	32	33	33	34	35	35	36	37	38
Mexico	5	6	7	7	7	8	8	8	8	8	8
North America	**47**	**54**	**55**	**57**	**58**	**59**	**60**	**60**	**61**	**62**	**62**
South/Central America	**9**	**9**	**10**	**10**	**10**	**10**	**11**	**11**	**11**	**12**	**12**
Africa	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**6**
Oceania	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Thermal coal imports	**576**	**616**	**646**	**677**	**692**	**711**	**740**	**770**	**797**	**823**	**850**
% yoy change	6%	7%	5%	5%	2%	3%	4%	4%	4%	3%	3%
Exports	2005	2006	2007	2008	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Australia	109	113	115	120	138	145	162	187	224	280	308
China	61	54	45	43	39	33	28	24	22	19	18
Vietnam	13	23	28	20	20	18	16	13	11	10	8
Indonesia	124	164	177	170	175	170	165	161	158	155	152
Asia/Pacific	**306**	**354**	**366**	**353**	**372**	**366**	**371**	**386**	**415**	**464**	**486**
US	19	20	24	26	18	18	16	15	13	12	11
Canada	1	3	4	4	4	5	5	5	5	5	6
Colombia	54	56	63	72	76	82	89	94	100	106	112
Venezuela	6	6	6	6	6	7	7	7	7	8	8
North/Central/South America	**80**	**85**	**97**	**109**	**105**	**112**	**117**	**121**	**126**	**131**	**136**
South Africa	73	66	66	65	67	69	71	73	75	78	80
Poland	18	13	10	9	9	9	9	9	9	9	9
Russia	64	77	84	88	90	92	94	95	97	99	101
Kazakhstan	28	27	28	28	29	29	30	30	31	32	32
Other	8	8	8	9	9	10	11	12	14	16	18
Thermal coal exports	**576**	**629**	**659**	**661**	**680**	**686**	**702**	**726**	**767**	**828**	**862**
% yoy change	6%	9%	5%	0%	3%	1%	2%	3%	6%	8%	4%
Trade surplus/(deficit)	**0**	**13**	**13**	**-16**	**-12**	**-26**	**-38**	**-43**	**-30**	**5**	**13**
% of imports		2%	2%	-2%	-2%	-4%	-5%	-6%	-4%	1%	1%
Annual increase	**34**	**53**	**30**	**2**	**19**	**5**	**16**	**24**	**41**	**61**	**34**
% increase pa	6%	9%	5%	0%	3%	1%	2%	3%	6%	8%	4%

Source: TEX, RBS forecasts

Supply-demand assumptions for seaborne metallurgical coal (mt)

	2005	2006	2007	2008	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Exports											
Australia	122	122	135	132	129	137	148	160	173	186	209
Indonesia	5	6	7	7	7	7	7	7	8	9	9
China	6	5	4	4	4	3	2	1	1	0	0
Asia/Pacific	**133**	**133**	**146**	**143**	**140**	**147**	**157**	**168**	**181**	**195**	**218**
US	26	24	19	22	22	23	23	22	22	22	22
Canada	27	30	32	35	33	33	35	38	40	42	44
Colombia	2	2	3	3	3	3	3	3	3	3	3
Central/North/South America	**54**	**56**	**53**	**59**	**58**	**59**	**60**	**63**	**65**	**67**	**69**
Poland	3	3	3	3	3	3	3	3	3	3	3
Russia	15	13	13	13	14	14	14	14	15	15	15
South Africa	3	2	3	3	3	3	3	3	3	3	3
Other	8	8	9	10	11	12	13	15	19	20	21
Total exports	**217**	**216**	**226**	**231**	**227**	**237**	**250**	**267**	**285**	**303**	**328**
Annual increase	**6**	**-1**	**10**	**5**	**-4**	**10**	**13**	**17**	**19**	**17**	**25**
% yoy change	**3.6%**	**3.8%**	**3.6%**	**2.1%**	**-1.6%**	**4.3%**	**5.5%**	**6.7%**	**7.1%**	**6.1%**	**8.4%**
Imports											
Japan	63	62	63	64	59	60	61	63	64	64	64
South Korea	18	18	17	20	18	19	20	21	21	21	21
Taiwan	8	8	9	9	8	8	8	8	8	8	8
China	8	5	6	6	32	35	38	43	47	52	57
India	19	21	23	24	25	27	31	37	44	51	60
Other	4	3	3	3	3	3	3	3	3	3	3
Asia/Pacific	**120**	**117**	**120**	**125**	**146**	**152**	**161**	**175**	**186**	**198**	**212**
EU	49	50	50	51	51	52	52	53	53	54	54
Other Europe	28	24	23	22	22	21	20	20	19	19	18
Europe	**77**	**74**	**73**	**73**	**73**	**73**	**73**	**73**	**72**	**72**	**72**
North America	8	8	8	8	7	7	7	7	7	7	7
Brazil	14	18	20	21	15	16	18	19	21	23	26
Other	2	2	2	2	2	2	2	2	2	2	2
North/South/Central America	24	28	30	32	24	25	27	29	30	32	35
Africa	4	5	5	5	5	5	5	5	5	5	5
Total imports	**224**	**224**	**229**	**235**	**249**	**255**	**265**	**280**	**294**	**308**	**324**
Annual increase	**3**	**0**	**5**	**6**	**14**	**6**	**11**	**15**	**14**	**14**	**16**
% yoy change	1.2%	-0.2%	2.1%	2.7%	5.8%	2.4%	4.2%	5.7%	4.8%	4.8%	5.2%
Trade surplus/(deficit)	**-7**	**-8**	**-3**	**-4**	**-21**	**-18**	**-16**	**-14**	**-9**	**-5**	**4**
% of imports	-3%	-4%	-1%	-2%	-9%	-7%	-6%	-5%	-3%	-2%	1%

Source: TEX, RBS forecasts

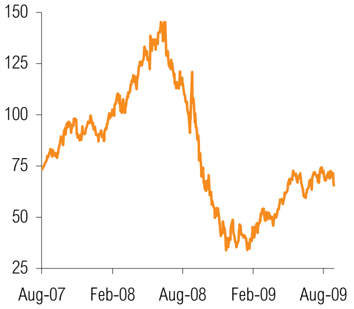
Crude oil

Looking for Q4 09 economic recovery

Brison Bickerton
Head of RBS Sempra
Commodities Energy Research
brison.bickerton@rbssempra.com
+1 203 897 5103

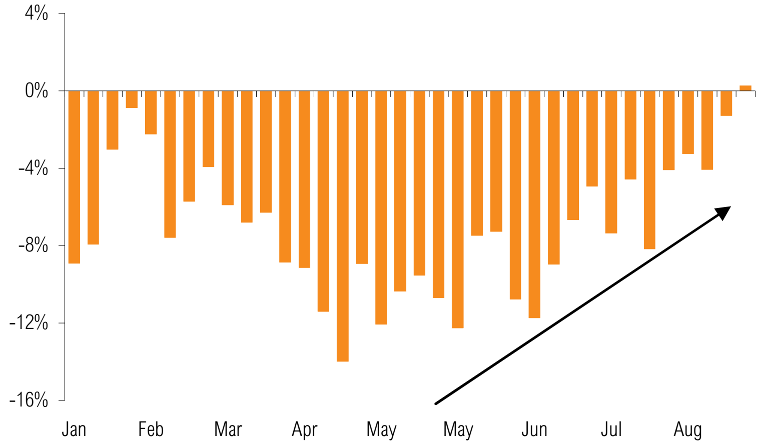
The crude oil market in the first half of 2009 managed to rally from a low of US$33.98 per barrel on 12 February to a high of US$74.37 per barrel on 24 August. This rally was in the face of awful economic news, job losses and real losses of petroleum demand. Crude inventories were rising to levels that resulted in approximately 100m barrels of crude oil to be stored in floating crude oil tankers. When crude stocks reached tank tops around the world, the market then began to fill distillate tanks and floating diesel/gasoil as well. As the following chart of total petroleum demand in the US shows, the demand shock was extreme, yet crude prices managed to rally through it all.

WTI's impressive rebound of 120% at its best US$/bbl



Source: NYMEX, RBS

Impressive improvement in US total petroleum product demand, yoy unrevised



Source: EIA, RBS

It would be very easy to dismiss this rally as non-fundamental. As we discuss next, the crude market continues to trade more in line with equity and currency markets than it does with the intrinsic supply-and-demand balance of crude. However, crude oil's rally alongside equity markets is a secular feature of today's crude market. There is little sign that crude is about to lose its correlation to global equities and other risk assets.

There is a longer-term dynamic at work as well. The crude market is increasingly forward-looking as spot prices carry a premium for concerns about future supply. Worries about 'peak oil' and insatiable BRIC demand growth for oil were not assuaged by the great deleveraging in 2008 and 2009.

The first half of 2009 was also notable in that OPEC exercised considerable restraint. While OPEC certainly has not held exactly to quotas, it has done enough to keep the physical market from ever getting completely sloppy. OPEC discipline in 2009 has been impressive, and rising demand in the fourth quarter of 2009 and into 2010 will make OPEC's job much easier.

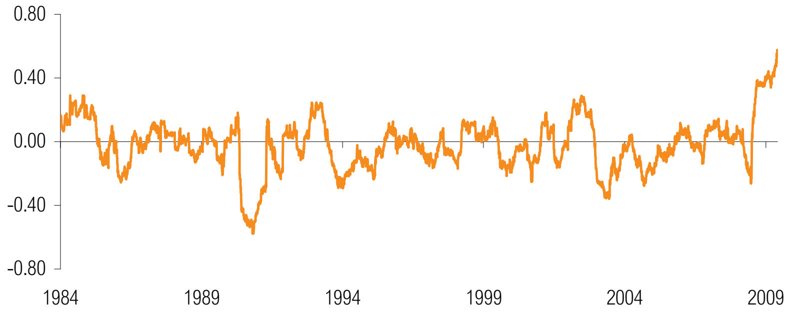
The rally in crude has brought prices to a level that is likely discounting a clean-up of the global overstock of crude and products. Over the next six months we expect the global oil market to slowly erode floating stocks of crude oil and distillates, and to begin to wear down onshore stocks of crude and products. The most visible of these are global distillate stocks (gasoil, diesel, heating oil).

The oil market managed to hold within the US$60-75 range despite a global economy that was still suffering a shock to aggregate demand. We believe the fourth quarter of 2009 will likely see a slow drawdown of global crude and product inventories as demand recovers and as OPEC 'cheats' a bit more against its quota, but does not open the spigots. We believe a real recovery in demand and a shrinking of the inventory overhang should drive prices higher in late 2009 and early 2010.

Oil continuing to price as a proxy for risk

The correlation of crude and equities is the strongest it has been in the history of NYMEX. While eras of correlation between crude oil and equities come and go, there is no doubt it is a very powerful force in today's crude market.

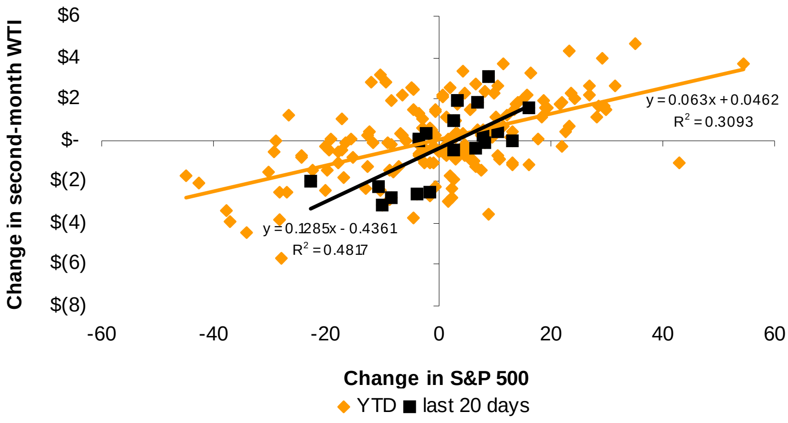
Trailing 6 month correlation of prompt crude and S&P 500



Source: Bloomberg, RBS

In the past month, crude has moved in the same direction as the S&P 500 for 15 out of 20 days.

Significant movements in equities are mostly matched by significant movements in the crude oil price



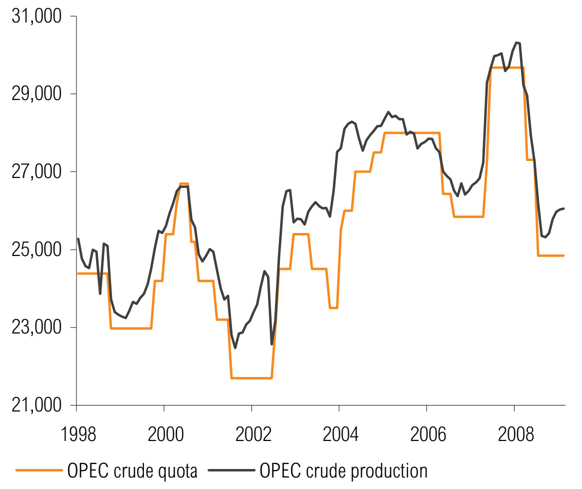
Source: Bloomberg, RBS

We will not call this a 'new era', but it is the secular environment that crude is trading in right now. Until the relationship breaks down, positive economic growth is likely to bring higher crude prices.

OPEC has done just enough

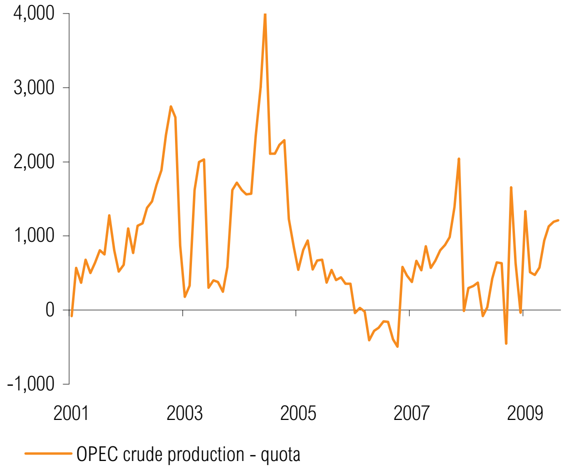
2009 will be remembered as a year in which, despite an enormous demand shock, OPEC managed to create a soft landing for crude prices by limiting quotas just enough to keep the market bullishly inclined to forward contracts.

OPEC (ex Iraq) quota and actual production (000bbl/d)



Source: IEA, RBS

OPEC (ex Iraq) actual production vs production quota (000bbl/d)



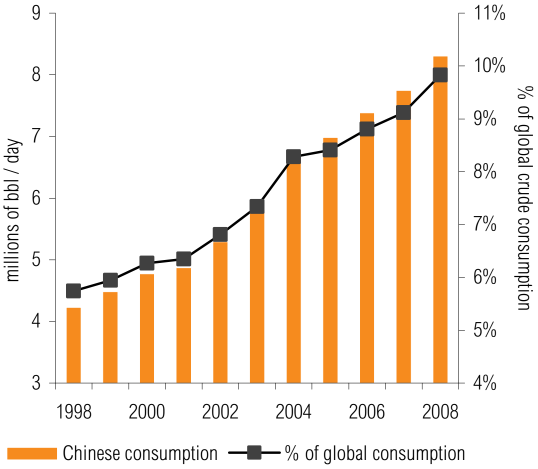
Source: IEA, RBS

While the trend in 2009 looks like one of increased 'cheating', this is arguably to serve rebounding demand. We believe the Q4 09 is likely to remain a challenge for OPEC, which will have to exercise restraint. The market simply has to see floating stocks and onshore commercial stocks of distillates drawdown. Until the market sees this occurring, refining margins will be under pressure, limiting demand for crude oil. We would expect in the fourth quarter economic growth and winter weather to lead to stock drawdowns. OPEC will have to maintain its quota and continue to be disciplined throughout the fourth quarter.

China drives oil demand

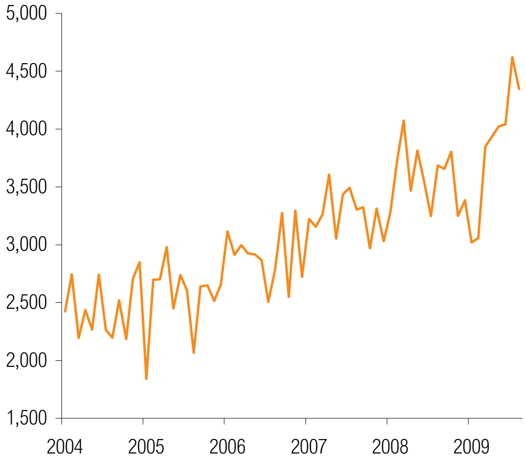
As with many commodities, in 2009, China has played a major role in supporting the oil price. Chinese demand has been resilient, driven by stimulus investments in roads, increased demand for transportation, and stockpiling. If you did not believe the Chinese commodity demand story before the great deleveraging, 2009 should lead to some reassessment. China clearly continues to drive demand for oil.

China petroleum consumption and China as % of global consumption



Source: BP Statistical Review, RBS

China crude imports – China's crude imports surged in 2009 in common with other commodities (Mbbl/day)

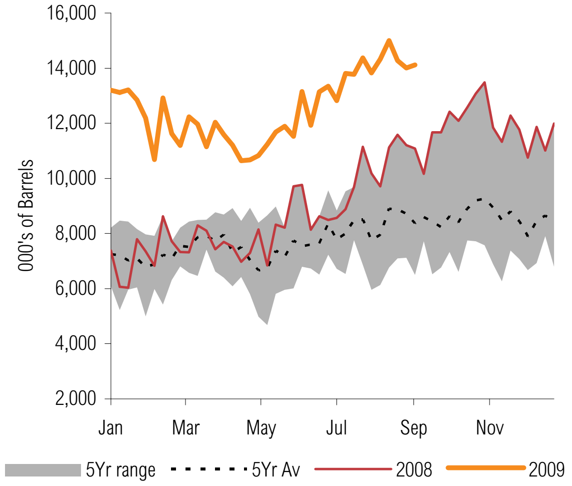


Source: Chinese General Administration of Customs, RBS

The distillate stock glut

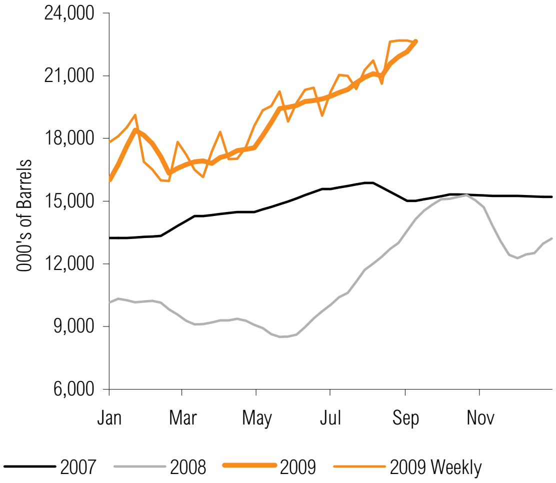
Distillate stocks are at tank tops around the world. Anecdotally 50m-100m barrels of gasoil are in floating storage. Stocks onshore are at the highest levels in decades in the US, Europe and Singapore.

Singapore middle distillate stocks



Source: Bloomberg, RBS

Antwerp-Rotterdam-Amsterdam gasoil stocks

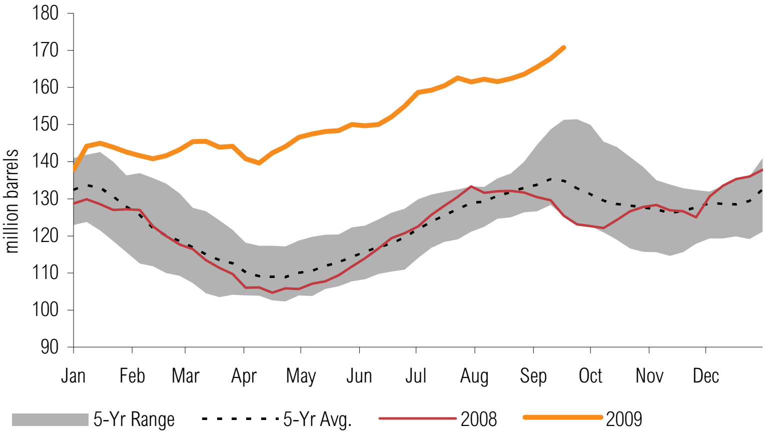


Source: Bloomberg, RBS

US and European distillate stocks began 2008 below average levels. By the beginning of summer, stocks were approaching quite constrained levels in Europe, and it was necessary for the US and Asia to do their part in meeting demand. To achieve this, refiners had to be incentivised to produce distillate. During the first three quarters of 2008, heating oil cracks averaged US$20.83/bbl and at times spiked to more than US$30/bbl. The global refinery system was incentivised to produce as much distillate as possible.

Demand unfortunately began to collapse in the winter of 2008/09, a collapse that extended all the way until the summer of 2009. While many refiners had optimised their plants to produce more distillate, jet fuel and trucking demand were among the hardest hit products in the petroleum space. Subsequently, refiners had overproduced distillates, leading to large stock builds.

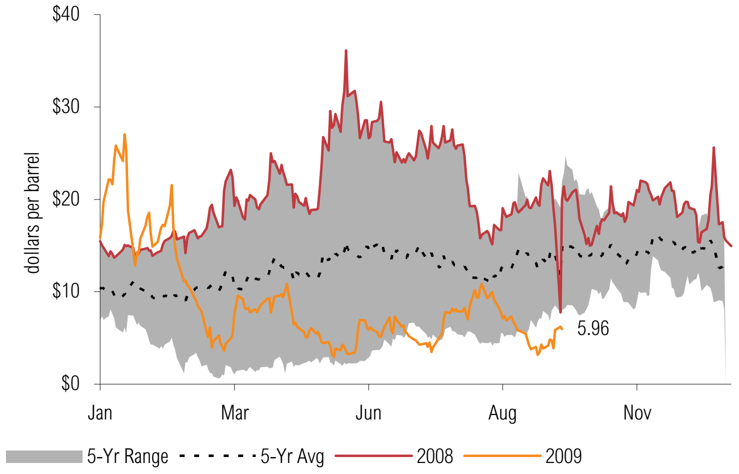
US distillate stocks are at their highest levels since 1983



Source: EIA, RBS

We have spent much of our energy in 2009 discussing this distillate glut, and the market has been ratcheting distillate margins lower and lower throughout 2009. We do believe that rising demand in late 2009 and 2010 will slowly erode distillate stock levels. However, we believe that during this long process distillate margins (as represented by the heating oil crack in the next chart) will remain near the bottom of their five-year range.

NYMEX prompt heating oil crack



Source: NYMEX, RBS

Oil price forecast to head towards US$80 in 2010

With any meaningful economic recovery we expect to see inventories drawn down and the call on OPEC increase. In its most recent *Oil Market Report*, the IEA has revised upwards the expected "call on OPEC" for 2010 by a full 0.5m barrels per day, which is a very significant revision. We expect to see the projected call on OPEC in 2010 to continue to creep upward, since in our view IEA's current projection is too low.

IEA global crude oil supply/demand balance

Mbbl/d	2006	2007	2008	2009F	2010F	Q109	Q209	Q309	Q409F	Q110F	Q210F	Q310F	Q410F
Demand													
OECD	49.5	49.2	47.6	45.4	45.4	46.6	44.5	44.8	45.7	46.5	44.6	45.0	45.5
Non-OECD	35.7	37.3	38.7	39.1	40.3	37.9	39.7	39.6	39.0	39.6	40.5	40.8	40.3
Global Demand	**85.2**	**86.5**	**86.3**	**84.4**	**85.7**	**84.5**	**84.1**	**84.4**	**84.7**	**86.0**	**85.1**	**85.8**	**85.9**
Supply													
OECD	20.1	19.9	19.3	19.1	18.8	19.7	19.1	18.7	19.0	19.4	18.8	18.5	19.1
Non-OECD	28.0	28.5	28.7	29.2	29.9	28.8	29.2	29.3	29.4	29.7	29.9	29.8	30.1
Processing Gains	2.1	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Other Biofuels	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
TOTAL NON-OPEC	**50.4**	**50.9**	**50.6**	**51.0**	**51.4**	**51.2**	**50.9**	**50.7**	**50.7**	**50.9**	**50.2**	**49.8**	**50.1**
NGLs	4.4	4.5	4.7	5.2	6.1	4.9	5.1	5.4	5.6	5.7	6.0	6.2	6.4
Call on OPEC crude	**30.4**	**31.1**	**31.0**	**28.2**	**28.2**	**28.4**	**28.1**	**28.3**	**28.0**	**28.6**	**27.9**	**28.7**	**27.6**

Source: International Energy Agency, OPEC, RBS Sempra forecasts

Lower stocks combined with OPEC's stronger hand will likely only embolden the bulls in the crude oil market. In common with other commodities, we forecast that higher prices lie ahead, although until inventories are meaningfully lower we would not expect crude to return until post-2010 to more than US$80/barrel.

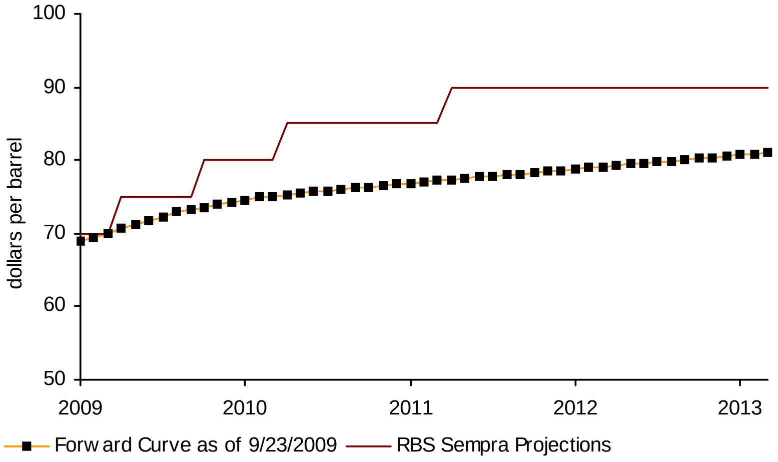
Longer term we expect the upturn in the business cycle to drive a recovery in real demand for petroleum products that will push prices up towards US$100/bbl by 2013.

RBS oil price forecasts

		2006A	2007A	2008A	2009F	2010F	2011F	2012F	2013F
WTI	US$/bbl	66.25	72.36	99.75	62	78	85	90	100
	% chg yoy		9%	38%	-38%	26%	10%	6%	11%
Brent	US$/bbl	66.13	72.66	98.52	63	79	87	92	102
	% chg yoy		10%	36%	-36%	26%	9%	6%	11%
		Q1 09A	**Q2 09A**	**Q3 09A**	**Q4 09F**	**Q1 10F**	**Q2 10F**	**Q3 10F**	**Q4 10F**
WTI	US$/bbl	43	60	68	75	75	75	80	80
	% chg qoq		38%	14%	10%	0%	0%	7%	0%
Brent	US$/bbl	46	60	69	77	77	77	82	82
	% chg qoq		31%	15%	11%	0%	0%	7%	0%

Source: NYMEX, ICE, RBS

NYMEX WTI crude oil forward curve and RBS price forecasts



Source: NYMEX, RBS

US natural gas

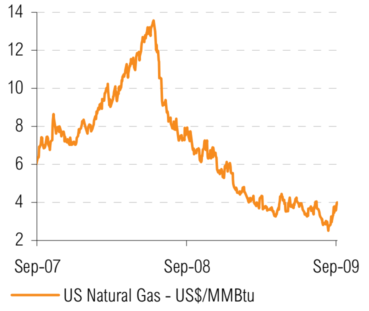
Prompt prices have likely bottomed

Brison Bickerton
Head of RBS Sempra Commodities Energy Research
brison.bickerton@rbssempra.com
+1 203 897 5103

Within the past few weeks, the US natural gas market has been volatile as it copes with impending record storage levels. The apparent risk of overfilling storage and forcing producer shut-ins drove the prompt contract down to a low of US$2.51/MMBtu. Recently, market perception that the physical market will avoid a glut has caused a short covering rally to nearly US$4.00/MMBtu. We believe prompt prices for natural gas have likely bottomed.

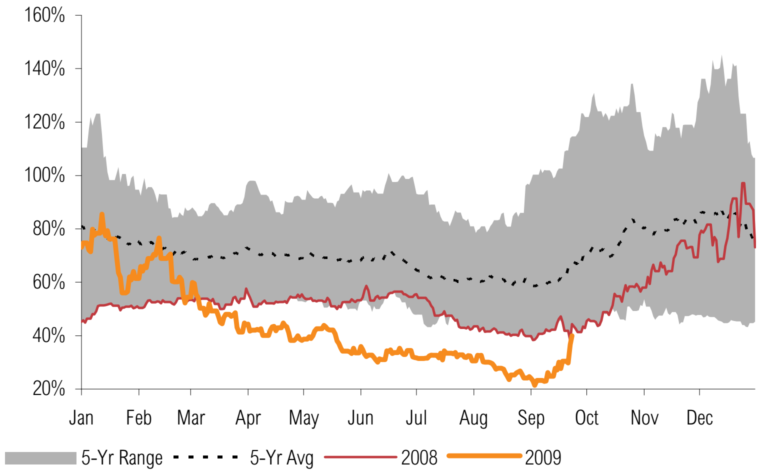
In the short term, the biggest risk we see to gas prices is in the early winter. The November contract is at the time of writing trading near US$4.75/MMBtu. With coal parity pricing likely within the US$4.00-$4.50/MMBtu range, the difference between US$3.75/MMBtu gas and US$4.75/MMBtu gas may be as much as 3 Bcf/d of demand from the power stack. That 3 Bcf/d may be the difference between builds and draws in the first three weeks of November, and while the physical market will likely be able to accommodate 3,825 Bcf in inventories at the end of October (our current projection), it may not be able to accommodate further stock builds into November.

Prompt US natural gas – prices have likely bottomed



Source: NYMEX

Prompt natural gas as % of prompt WTI, energy-equivalent basis



Source: NYMEX, RBS

The summer of 2009 was notable for the relentless decline in prompt gas pricing. At the bottom, NYMEX prices were down more than 80% from the July 2008 high.

Surprisingly, there has not been a wave of bankruptcies in the US Exploration and Production (E&P) industry. Certainly, US E&Ps focused on domestic gas were hurt, but there was not a wave of properties sold at fire-sale prices. The industry weathered these low prices fairly well, thanks in large part to good hedging policies and aggressive moves to cut costs as commodity prices fell.

Having weathered the storm of the summer of 2009, we believe North American natural gas producers can look forward to a winter in which excessive inventories are slowly cleaned up. While it will take more than one season to put the US natural gas market on anything resembling a bullish footing, at least fundamental balances will not continue to threaten to drive prices down to shut-in economics. This, in our assessment, is not an environment in which US NYMEX gas contracts need to retain a risk premium for heavy weather. Neither should this winter be especially bullish, considering that inventories will be at a surplus to last year's already-hefty levels. Futures are likely fairly priced here.

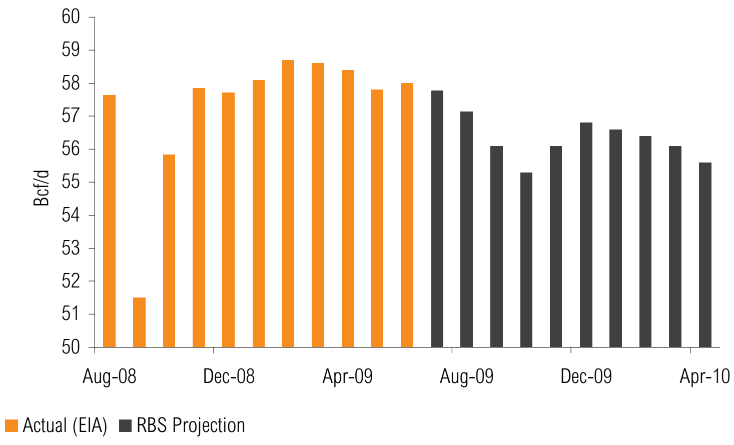
Winter 2009/10 US natural gas supply demand outlook

	Winter 08/09			Winter 09/10	
	Carry-in	**3,399**		**Carry-in**	**3,825**
	Days:	151		**Days:**	151
	(Bcf/d)	**Bcf**	**yoy change (Bcf/d)**	**(Bcf/d)**	**Bcf**
Production	57.25	8,645	(2.00)	55.25	8,343
Canada Imports	7.50	1,133	(1.00)	6.50	982
LNG Imports	1.00	151	0.25	1.25	189
Total Supply	**65.75**	**9,928**	**(2.75)**	**63.00**	**9,514**
R&C Demand	36.50	5,512	0.00	36.50	5,512
Industrial	18.00	2,718	0.50	18.50	2,794
Power Gen	16.00	2,416	0.00	16.00	2,416
Pipe & Lease	5.80	876	0.00	5.80	876
Exports	1.00	151	0.00	1.00	151
Total Demand	**77.3**	**11,672**	**0.50**	**77.8**	**11,748**
	Draw	**(1,744)**	**(3.25)**	**Draw**	**(2,234)**
	Carry-out	**1,656**		**Carry-out**	**1,591**

Source: RBS forecasts

The biggest wildcard for the North American natural gas market this winter is production. We expect it will be 2 Bcf/d lower yoy. While most production models would call for steeper declines than that, we simply have not yet seen supporting evidence. Also, since last winter roughly 0.75-1.0 Bcf/d of supply was still offline due to hurricane damage sustained in the fall of 2008, a 2.0 Bcf/d decline in actual production would involve a nearly 3.0 Bcf/d decline in onshore production.

US dry natural gas production is expected to decline moderately



Source: EIA, RBS

We believe major production declines are still to be expected from Canada, and we expect to see that reflected in imports. We project Canadian imports down 1.0 Bcf/d from last winter.

We project LNG imports into the US will be up marginally from last winter. UK and US prices are near parity, and premium Northeast markets should be able to draw some spot cargoes. We believe that over the course of the next year the LNG market should loosen up considerably as long-delayed new supply comes on line, but that will likely not affect the market greatly until the late winter or spring.

On the demand side we project industrial demand to be up 0.5 Bcf/d as the economy recovers. The scale of shutdowns we saw indicated by the inventory reports last winter, particularly in December and January, likely means that even if the recovery is muted there should be an improvement in industrial demand.

The same assumption regarding economic recovery applies to overall power loads as well. However, the current forward strip would place natural gas at a disadvantage to coal for power generation. Last winter we did see some coal displacement in November and again in February and March, so if we do not see that again this winter, then the net effect will likely be to hold gas demand from the power stack constant. Additionally, there is a significant amount of new coal-fired generation coming on line in late 2009 and 2010 that should out-compete gas at current forward prices.

The combined effect of these would take inventories down to approximately 1,600 Bcf, slightly below last winter's carry-out. 1,600 Bcf is an ample amount of gas.

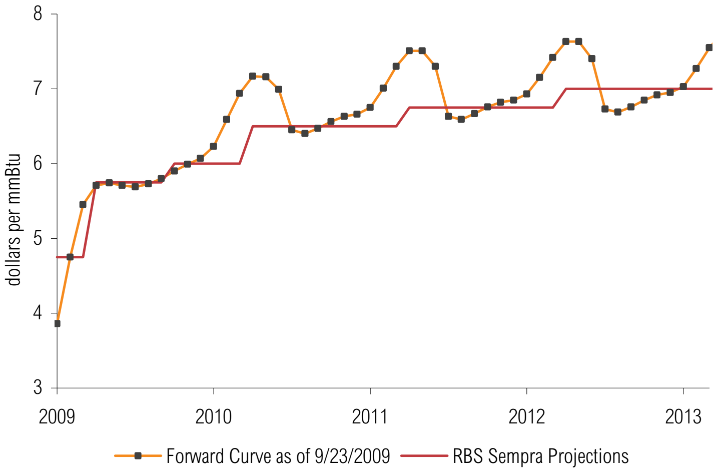
When discussing winter inventory projections, it is always important to note the effect of weather, which can increase or decrease heating demand (and thus inventory levels) by as much as 250 Bcf over the course of the winter. We expect similar weather to last year, and our flat residential and commercial demand figure reflects that expectation, but weather is always a substantial – indeed, typically the largest – risk to any forecast.

RBS Henry Hub natural gas price forecasts

		2006A	2007A	2008A	2009F	2010F	2011F	2012F	2013F
H-Hub nat gas	US$MMBtu	6.98	7.12	8.90	4.25	6.25	6.50	6.75	7.00
	% chg yoy		2%	25%	-53%	48%	4%	4%	4%
		Q109A	**Q209A**	**Q309A**	**Q409F**	**Q110F**	**Q210F**	**Q310F**	**Q410F**
H-Hub nat gas	US$MMBtu	4.47	3.81	3.44	5.25	5.75	6.25	6.50	6.50
	% chg qoq		-15%	-11%	55%	10%	9%	4%	0%

Source: NYMEX, RBS

NYMEX natural gas forward curve and RBS price forecasts



Source: NYMEX, RBS

Uranium

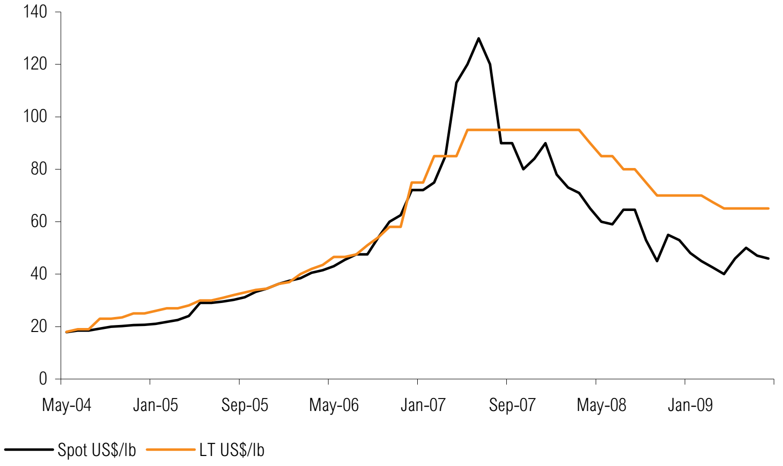
Warren Edney, Australia
Senior Mining Analyst
warren.edney@rbs.com
+613 9612 1557

RBS Australian Mining Team

Uranium demand is on the rise

We think it is finally safe to say that the days of sub-US$20/lb uranium are history. New mine operating costs are in the US$20-30/lb range, and more natural uranium will be required by 2014F, when we expect the market to move into supply deficit.

Spot and long-term uranium prices (US$/lb) Price was not immune to the selling that engulfed other commodities



Source: UxC

Bullish mid-term outlook for uranium maintained

Our modelling indicates that the uranium market will move into supply deficit in 2014. This should be reflected gradually in the term market premium over spot. We believe the spot market, which accounts for less than 15% of traded uranium, is likely to be more volatile and reflect trading activity, but also to maintain an upward trend. **We forecast both prices will peak in late 2011 at US$95/lb** as the market tightens prior to the expiry of the US-Russian highly enriched uranium (HEU) down-blending programme in 2013.

World demand consistently increasing as new reactors are built

The growth in the construction of nuclear power capacity continues to increase yoy. **There are currently 48 reactors under construction, compared with 34 in 2008 and 32 in 2007.** The higher construction rate is being driven by China and Russia, and we expect this to continue.

Downside risk to future supply

The adequacy of future uranium supply hinges on the ability of mine production and reprocessing capacity to offset the exit of Russian HEU from the market. There have been tangible production increases, with Kazatomprom on track to achieve its production target of 15ktpa by 2010. Logistical, statutory and operating bottlenecks are ongoing issues in key growth regions such as Canada, Namibia and Australia.

Uranium – rising demand, inconsistent supply

The sharp increase in the number of planned and proposed reactors over the past three years has begun to be realised through growing construction rates, predominantly in China and Russia. The Russian nuclear statutory body, Rosatom, recently reinforced market expectations of an end to the 'megatonnes to megawatts' programme in 2013, marking the horizon of forecast supply tightness. Tangible production success in Kazakhstan, where the state atomic company, Kazatomprom, appears to be on track to achieve its production target of 15ktpa by 2010, helps to offset our forecast supply deficit.

However, mine developments in other growth regions have stalled due to a combination of logistical, statutory and financial realities. The balance of this is that we see support for the uranium price increasing towards 2013 as new reactor capacity comes on stream and HEU supply ends. We forecast new primary supply will offset demand in the near term, but, in our view, inherent delays in the mine commissioning and construction process are a risk to supply in the medium term, supporting an increase in the uranium price over this period.

Supply/demand

Year-end: December (tU)	2009F	2010F	2011F	2012F	2013F	2014F	2015F
Mine production	48,472	53,187	56,353	57,850	59,706	63,159	63,937
Total secondary	23,326	22,918	22,534	21,766	18,886	10,997	8,862
Total U supply	71,798	76,105	78,887	79,616	78,592	74,156	72,799
Base-case demand	66,412	67,619	69,028	70,693	72,620	76,137	82,448
Surplus/deficit	**5,386**	**8,486**	**9,859**	**8,923**	**5,972**	**-1,981**	**-9,649**

Source: RBS forecasts

Our uranium price forecasts remain unchanged, with the only difference relating to the mark to market of 3Q09 spot prices.

Uranium price forecasts

Year-end: December (US$/lb)	2009F	2010F	2011F	2012F	2013F	2014F	LT
Spot	**47.40**	**58.75**	**82.50**	**82.50**	**65.00**	**65.00**	**65.00**

Source: RBS forecasts

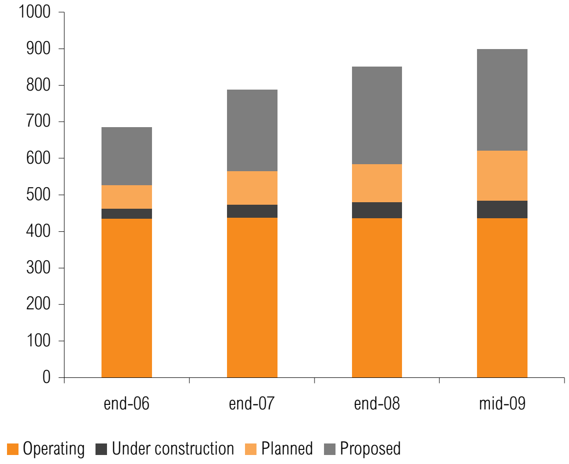
Demand for uranium growing

Rate of reactor construction increasing

Growth in the construction of nuclear power capacity continues to increase yoy as flow-through from a sharp increase in planned and proposed capacity is realised in construction starts. There are now 48 reactors under construction, compared with 34 at this time in 2008 and 32 in 2007.

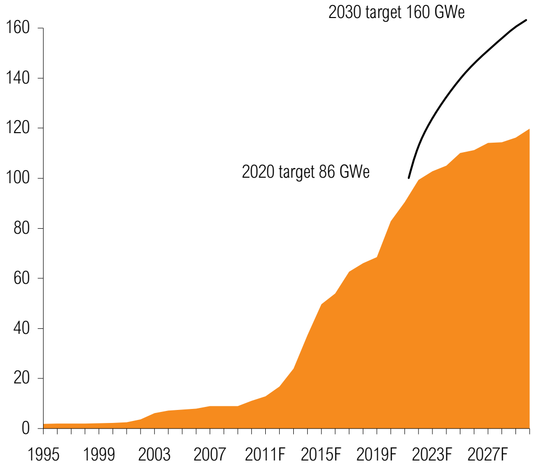
China increased its nuclear energy target from 40GWe to 60GWe, and now to 86GWe by 2020. We note that even at this increased target and the corresponding nuclear build rate required, this would still be less aggressive than the peak nuclear construction rate reached by the US in the early 1970s. Therefore, we consider China's 2020 target to be achievable. However, given the timeframe, we have moderated the build rate beyond 2020 (see next chart). The National Development and Reform Commission's target for 2030 is 160GWe, and although we believe this is certainly possible, it is too far out to factor into our forecasts.

Reactor build profile (number of reactors)



Source: WNA

Modelled vs targeted Chinese nuclear power capacity (GWe)

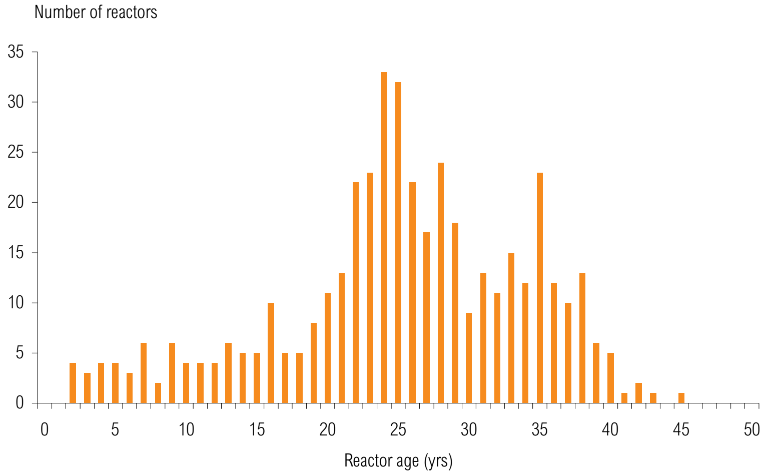


Source: WNA, National Development and Reform Commission, RBS forecasts

Licence extensions to extend existing capacity

It would appear that the ongoing political machinations regarding the trade-off between the environmental and financial costs of power supply are turning further in favour of nuclear power as the issue plays out around the world. Previously tabled plans to wind back nuclear capacity in Germany and the UK have been delayed or reversed due to the absence of acceptable alternatives. A similar scenario is observable in the US, where licence extensions are prolonging reactor life. France continues to build on its nuclear programme, which is supporting the power requirements of Italy, Belgium and Switzerland.

Number of reactors and their age, 2008



Source: IAEA, WNA, RBS

Capital costs a hurdle in the western world

The cost of uranium in power generation currently comprises about 20% of the generating cost

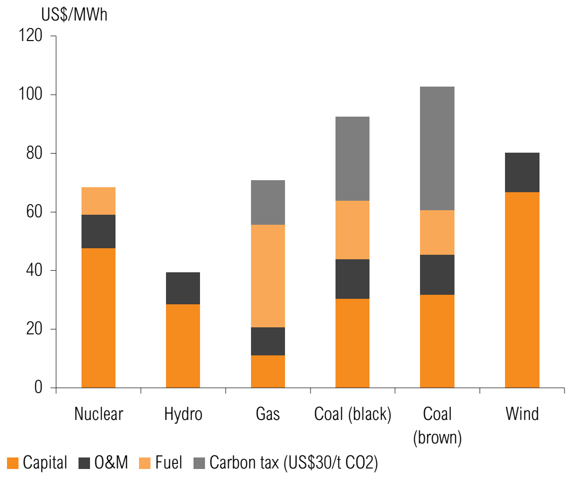
Costs of capacity and supply

Capital costs remain the key impediment to increasing nuclear capacity in the western world. In the US, this cost is now more than US$4000/kW, vs US$2000/kW in China and US$1200/kW in India. The Obama administration has recognised the regulatory approval process as an area where the cost impediment of nuclear capacity can be reduced, and it intends to address this issue. However, we expect no material change in capital costs in the near term.

The operational costs of nuclear power remain below those of oil, gas and coal, at about US$0.02c/kWhr. In the lead up to the GFC there was some divergence between the opex costs of nuclear and carbon-based power supply as the tightness in carbon fuel markets flowed into utility operating costs. Nuclear-based power costs were unaffected due to the small proportion of its operating costs attributable to natural uranium procurement. The downside was the proportionally higher increase in capital expenditure for new reactors.

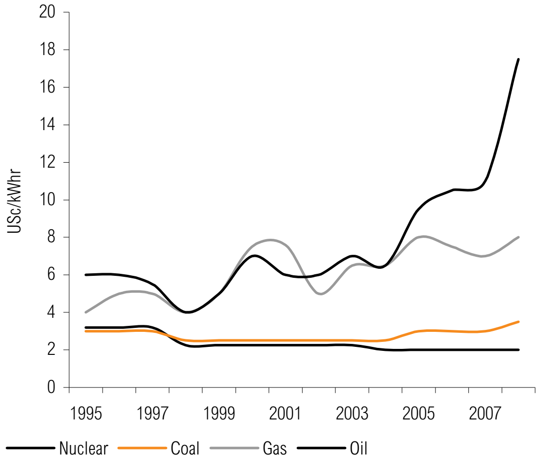
Looking forward, the nebulous discussion regarding the pricing of carbon dioxide emissions continues to intensify in the lead up to the Copenhagen Climate Change Conference, which opens on 7 December 2009. We expect no consensus to be reached on the global pricing of carbon, but the event will mark another small step on the seemingly inevitable journey towards more expensive carbon emissions in the western world.

2008 cost breakdown of power production (US$/MWhr)



Source: RBS estimates

Fuel cost of power production (USc/kWhr)

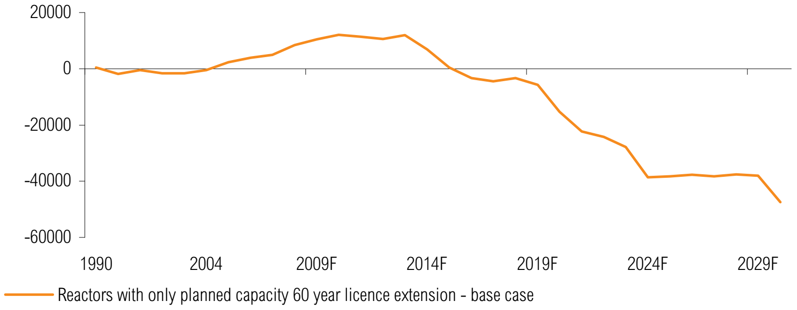


Source: World Nuclear Association

Supply OK now, but what about later?

There are three major sources of uranium supply: primary or mine supply, HEU down-blending and tails reprocessing. Currently, about 15% of uranium supply comes from the down-blending of Russian stockpiles of HEU under the 'megatonnes to megawatts' programme. This programme will end in 2013, at which time mine supply and the reprocessing of uranium tails material will be required to meet demand going forward. We forecast the market will tighten from 2013 onward, despite expected increases from these two supply streams.

Implied uranium surplus/deficit (tU)



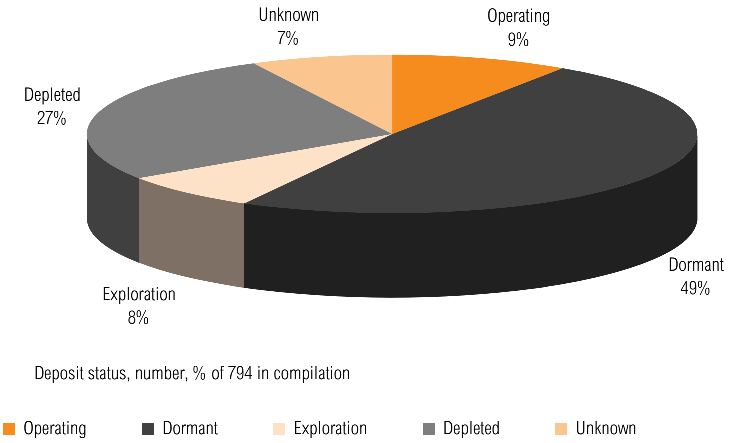
Source: RBS forecasts, WNA

There is no shortage of uranium, but getting it out of the ground economically remains an issue

Plenty of natural uranium to go around – but getting at it economically

Uranium is not an uncommon element and has a relatively broad geographical distribution. Exploration for uranium is immature compared with that for say the fossil fuels. There was no concerted exploration for uranium until the 1940s and uranium's exploration budget has undergone two booms since then: in the 1970-80s (brought to an end due to low prices) and from 2005 onward (stimulated by an increase in the uranium price from its long-term lows). A joint study by the UN International Atomic Energy Agency (IAEA) and the OECD estimates the total amount of conventional uranium stock that could be mined profitably at a price of up to US$130/kg (US$59/lb) is about 4.7Mt of U3O8. Based on the 2004 rate of demand, that is sufficient for 85 years. However, getting it out of the ground economically has been, and remains, an issue.

Status of world uranium deposits



Source: IAEA

We consider our modelling of new mine supply to be generous in taking target dates and production volumes at face value from a variety of state and private uranium mining entities. In reality, we expect the inherent delays in mine construction and commissioning to result in actual production lagging the stated targets. Recent examples of globally significant production delays are the deferral of the Olympic Dam expansion from 2013 to around 2016 and the delay of Cigar Lake production from 2007 to beyond 2011. Mines currently in production at McArthur River and Langer Heinrich have also missed production targets in the past 12 months due to maintenance and ramp-up complications.

Development delays or cancellations

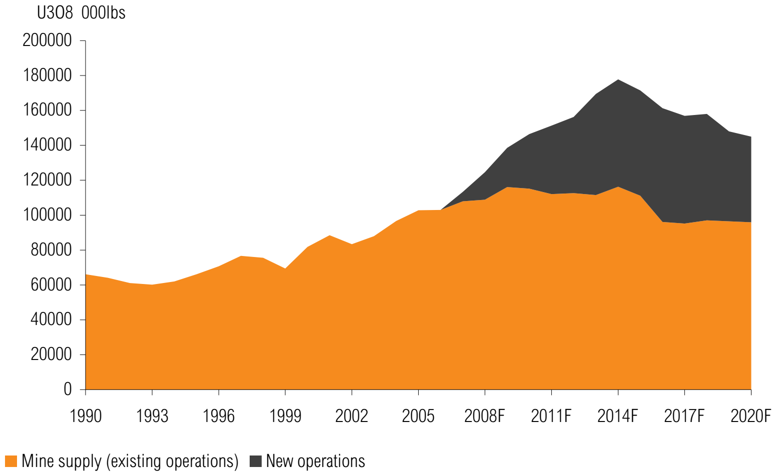
Project	Original start date	Capacity (tU)
Dominion	2007	1,460
Hobson/La Palangana	2009	385
Midwest	2011	3,300
McClean Lake (Caribou)	2009	?
Tony M	2007	?
Vasquez	2007	300
Kingsville Dome/Rosita	2006	300
J-Bird	2008	?
Rim, Topaz and Sunday mines	2006	?
Cigar Lake	2005	18,000
ODO expansion	2013	+10,000

Source: Cameco, RBS estimates

We also note a series of bottlenecks appearing in key growth areas, such as Namibia, where access to process water has already impeded the expansion of current production and will probably hamper additional production. We believe legislation and statutory requirements are likely to delay forecast production in Australia, specifically in Western Australia, where BHP and Cameco-Mitsubishi are developing the Yeelirrie and Kintyre deposits, respectively. Exploration and resource definition work recently commenced on these deposits due to a change in state government policy, but regulatory frameworks are still evolving and are likely to attract intense public scrutiny.

We see downside risk to our forward mine supply estimates

Uranium mine supply new mines are on their way – 1990 -2020F



Source: Company data, RBS forecasts

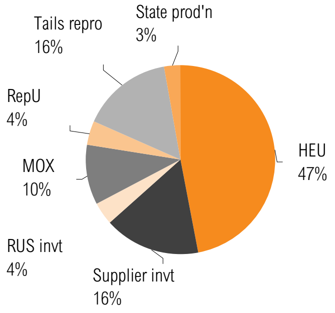
Secondary supply still the key issue, in our view

The supply of natural uranium (mine) has not met demand since the mid 1980s. This deficit has been offset by the drawing down of uranium inventories built up during the Cold War. The largest of the inventory-reprocessing programmes, the US-Russia inventory agreement, is scheduled to end in four years, thus requiring a significant increase in mine and tails reprocessing supply to maintain the market balance.

Megatons to megawatts down-blending to end in 2013

The US-Russian HEU agreement is due to expire in 2013. This programme currently provides the equivalent of 9,100t U3O8 pa. Of this, western suppliers Cameco, Cogema and NUKEM hold an option to purchase 6,700t pa, with the remainder to be held by the Russian government for sales, primarily to the US. However, since 1994, annual deliveries have been plagued by inconsistencies that have proved to be a hurdle when renegotiating contracts with large western utilities.

Sources of secondary uranium supply, 2009



Source: RBS estimates

Rosatom, the government corporation that regulates Russia's HEU inventory, is on record as saying that it has no intention of continuing to down-blend HEU after 2013. The agreement was struck in 1993 after the breakup of the USSR and at a time when Russia needed the money. Now, Russia has a greater need for the uranium to fuel its power plants and is therefore unlikely to want to give up any more nuclear warheads.

Enrichment capacity underutilised

Most of the spent fuel components generated by nuclear reactors can be recovered and recycled. The extent to which this occurs is governed by the cost of recovery vs the cost of equivalent primary supply.

The energy, and therefore cost, of uranium enrichment is measured in separative work units per kilo of uranium concentrate produced (SWU/kg). There is an inverse relationship between the uranium grade of tails material (waste left over from the uranium-enrichment process) and the number of SWUs applied in the concentration process. Therefore, as natural uranium becomes more expensive, the economics of uranium concentration justify a more intensive concentration process (a higher SWU/kg) to capture a greater proportion of the active uranium (U235) present in the process material.

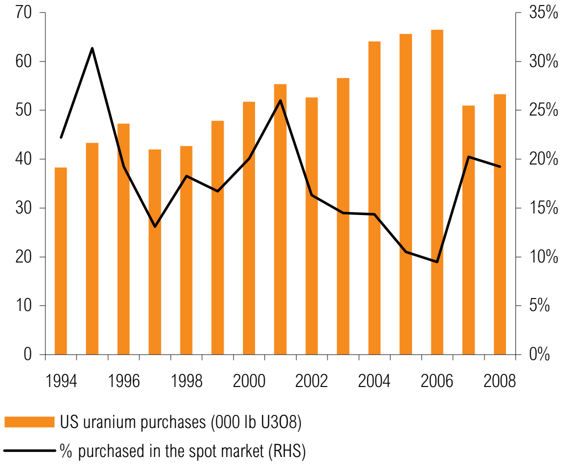
Therefore, a decrease in the tails assay of reprocessed material across the industry would lead to an increase in secondary supply and therefore to a reduction in the demand for natural uranium. We understand that the economics of this process are favourable in the current price environment. However, we do not believe that a move in this direction across the industry would be enough to materially change the deficit that we forecast in the natural uranium market.

Pricing dynamics

While readily visible, the spot uranium market still represents only 10-15% of global uranium trade. The spot market facilitates about 100 transactions per year spread among about 40 participants, although recently there has been an increase in activity from speculators. In addition, Chinese utilities have shown a willingness to enter the spot market as and when prices support the economics of buying and holding vs deferring purchases until reactor feed material is required.

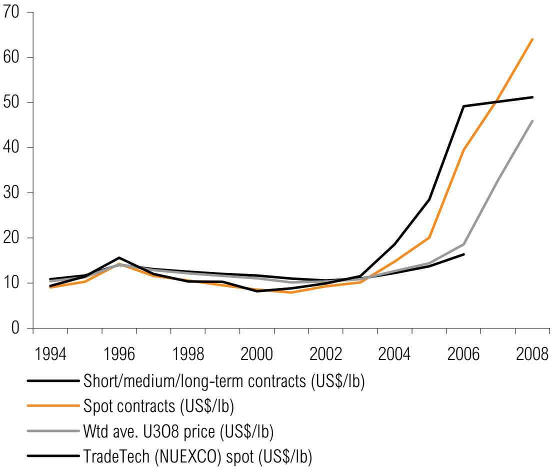
We see that prices in the term market, which represents 85-90% of volume traded, will remain above the spot price over the mid-term. We believe this will be driven by two key factors: the pending expiry of the 'megatonnes to megawatts' programme in 2013, and the number of reactors entering the market for their first and second fuel loads at roughly the same time.

US uranium purchases and % of trades made in the spot market



Source: DOE

Pricing differentials for US nuclear generators (US$/lb)



Source: DOE

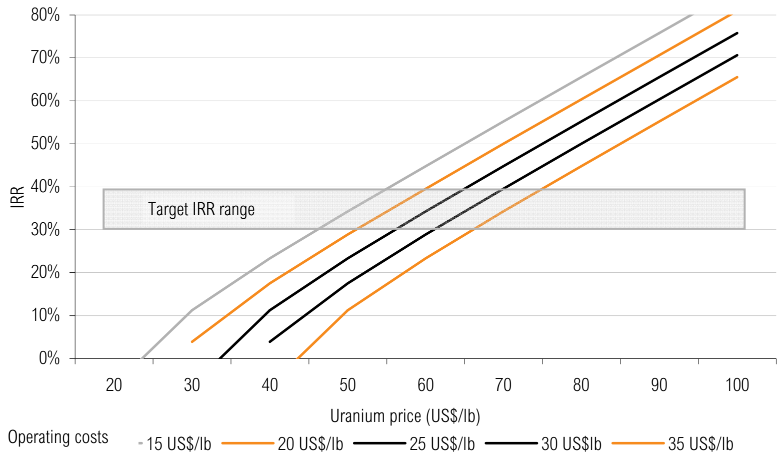
Our long-term price assumption still driven by incentive to build new capacity

The uranium market is relatively immature, and we believe it is probably another 10-20 years from achieving some sort of equilibrium between the uranium price and operating costs of new mine capacity. Production figures and BFS studies of recently commissioned or proposed uranium mines have returned cash costs within the range of US$20-30/lb. This is about 100% above the long-term average uranium price of about US$13/lb. We are of the opinion that the days of uranium prices of less than US$20/lb are behind us and that a new base price will be established over time that allows an acceptable return on new capacity.

In calculating our incentive price, we have assumed cash costs of US$20-30/lb (reflective of recent new capacity) and capex of US$68/lb (similar to PDN's Kayelekera project). Based on our expectation that most new developments will be in countries with some sovereign risk, we believe companies will require a project to achieve a 30-40% internal rate of return (IRR). The resultant chart indicates that an incentive price within the range of US$50-75/lb would be required to ensure new capacity is brought on line. Our long-term price assumption remains at US$65/lb, near the middle of this range.

Our long-term price is US$65/lb, based on generating an adequate return in countries with some sovereign risk

IRR at various uranium prices and operating costs



Source: RBS estimates

In summary, we expect the demand for uranium to increase consistently from current levels as the number of reactors under construction grows and as those now under construction come on line. On the supply side we see 2013 as a potential turning point for the surplus/deficit dynamic. While we believe additional mine capacity should meet or exceed demand over the next four years, we see considerable supply-side risks beyond that period and we expect uranium prices to increase as a result.

Commodity & FX relationships

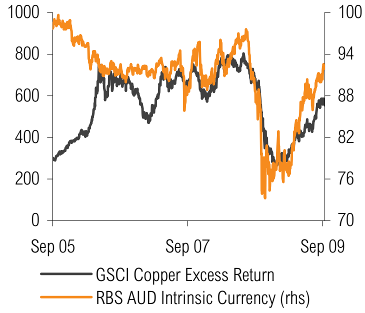
Quant analytics provided by Toby Wade and Theodore Chen – RBS Quant Analytics

Introduction

We know that there is a link between commodity prices and the US dollar. Even more, we know that there are links between commodity prices and commodity currencies. We can now take this further by identifying which market tends to lead, lag or if at all. It may come as a surprise to the reader, but our analysis finds that lags in FX tend to cause (predict) commodity prices.

We test lead-lag relationships using a known econometric technique called Granger Causality (GC). So, for example, we know there are periods where a move in the Australian dollar tends to predict copper prices. We note that this particular relationship began very clearly from January 2006 onward.

Copper vs Australian dollar



Source: LME

The GC concept can be very powerful. The method entails **identifying statistical significance for one-way lead-lag relationships**. Specifically, if exchange rate lag causes commodity prices today and not vice versa, then GC exists for exchange rate causing commodity prices. In addition, GC will not exist if both commodity prices and exchange rate cause one another or if both are not statistically significant. The key is to find a clear one-way directional relationship. For example, we found that AUD/USD and copper prices have no clear directional relationship, so it is difficult to use either one as a leading indicator for the other. However, this can be overcome by using the RBS Intrinsic Currency Model.

RBS Intrinsic Currency Model

The RBS Intrinsic Currency Model is a statistical model for estimating the value of a currency in its own right. Traditionally, the market convention uses trade-weighted indices (TWI) produced by the Bank of England for example. The RBS Intrinsic Currency Model is a quantitative alternative to this qualitative approach. Problems with qualitative approaches are that they are not consistent with rates observed within the market. The RBS Intrinsic Currency Model provides individual currency values that are fully consistent with the spot FX market, and reflects the intuitive correlation structure that exists between the underlying economies. With this approach, one can attribute for a currency pair how much of a percent increase/decrease is due to the individual currency. For example, if the GBP/USD falls by 2% over one day, how much is due to GBP and how much is due to the USD?

As a result of the Granger Causality in-sample testing from January 1999 to December 2004 and associating each commodity with a top three importing, exporting, producing and/or consuming country, the next table summarises the testing results on a monthly basis. For example, Australian dollars (AUD), Chilean peso (CLP), and US dollars can be used to predict copper prices.

RBS intrinsic currencies that have statistically significant leading relationships by metal, on monthly basis (ie which intrinsic currencies cause metal prices)

Metal	Statistically significant	Statistically insignificant
Gold	AUD	ZAR, PEN
Silver	PEN, CNY	AUD, MXP
Copper	AUD, CLP, USD	NZD, TWD
Aluminium	RUB, CAD	CNY, JPY
Nickel	CAD, Silver	RUB, AUD
Zinc	CNY, PEN, AUD, Silver	
Lead	AUD, PEN	KRW

Source: RBS

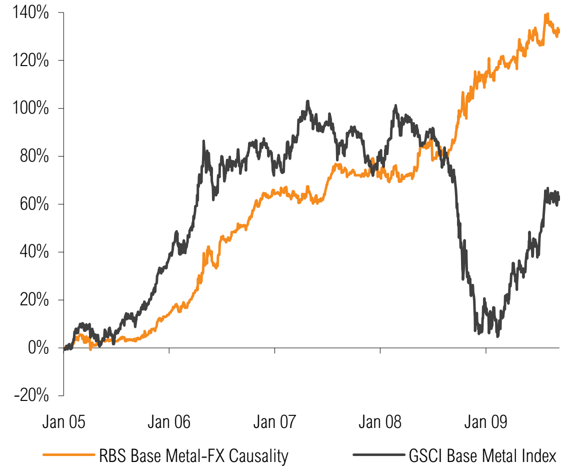
Why is the relationship this way round?

The conventional market wisdom is that commodities on a fundamental level clearly influence currency rates, relating to costs of production. However, the currency markets are more liquid and are **increasingly used by speculators to take macro views as proxies of other asset classes**. In addition, currencies tend to be more forward-looking than commodities. Therefore, we are able to utilise the FX information to predict commodity prices. Indeed, recent academic research points to this very phenomenon. [1]

Alpha models for metals

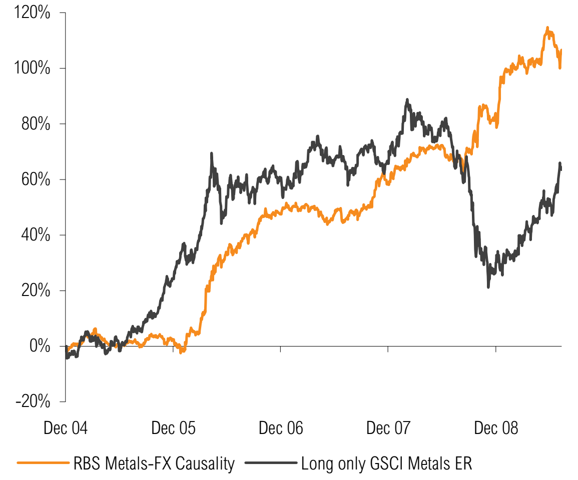
Using the preceding information, we are able to construct a forecasting alpha model to predict both medium- and short-term metal prices using lag FX values. The medium-term (monthly) model of an equal weighted portfolio of base metals (Al, Cu, Ni, Pb, Zn) provides an average annual return of 27.3% over the out-of-sample period of Jan 05-Jul 08, after transaction costs, with an information ratio of 1.57. For the short-term model, a liquidity-based weighted portfolio of base (Al, Cu, Ni, Pb, Zn) and precious (Au, Ag) metals provides average annual returns of approx 23% over the out-of-sample period of Jan 05-Jul 08, after transaction costs, with an information ratio of 1.65. The key highlights of the model are lower transaction costs, low correlation risk, strong liquidity, high IR, a stop-loss mechanism, including an inventory demand/supply overlay, and incorporating forward-looking FX.

Medium-Term Base Metals Alpha Model – medium monthly lead-lag model



Source: Bloomberg, RBS

Short-Term Metals Alpha Model – short-term daily lead-lag model



Source: Bloomberg, RBS

Conclusion

Analysing relationships between markets and asset classes is fertile hunting ground for excess return. There are apparent linkages between currency and commodity markets. Innovation is required to identify meaningful relationships. Marrying together systematic analysis and fundamental market knowledge is beneficial. Care is required to cope with changes in the market structure and drivers.

(1) *Can Exchange Rates Forecast Commodity Prices?, Chen, Rogoff, Rossi, Feb 2008*

Commodity Companion appendix

Vital statistics of the commodity markets

Guide to everyday uses for commodities 131

A simple guide to commodity indices 134

Commodity indices – negative roll reduces returns 138

Precious metal ETFs – stabilisation 140

World's top commodity producers and consumers 142

Global refined base & precious metal production and consumption 154

World's top 50 central bank gold holdings 159

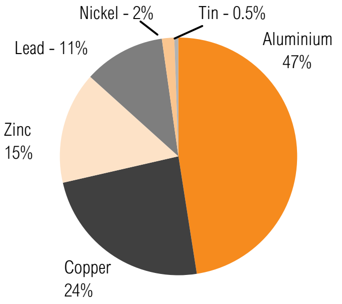
30-year real and nominal base and precious metal prices 160

Glossary of useful mining and industry websites 163

Guide to everyday uses for commodities

Aluminium. Aluminium production begins with the mining of bauxite, which is refined to alumina and then converted to aluminium metal. Refined metal, in turn, is used in many consumer sectors such as beverage cans, foil and food packaging, white goods, automobiles, trucks, trains and aircraft, building and construction, and electrical application such as cables.

Base metals global market share by volume, five-year average



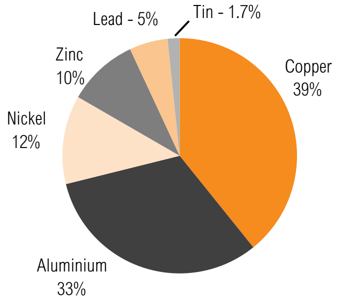
Source: WBMS, ILZSG,

Cobalt. This is a strategic and critical metal used in many diverse industrial and military applications. The largest use of cobalt is in super alloys, which are used to make parts for gas turbine aircraft engines. Cobalt is also used to make magnets; corrosion-resistant and wear-resistant alloys; high-speed steels' cemented carbides and diamond tools; catalysts for the petroleum and chemical industries; drying agents for paints, varnishes and inks; ground coats for porcelain enamels; pigments; battery electrodes; steel-belted radial tyres; and magnetic recording media.

Copper. Copper is used in the electrical industry both as a conductor (wiring and cable) and for electrical equipment. It is also used in the power industry for large-scale electrical transmission. Copper is widely used in tubing for drinking water and in central heating and air conditioning systems. It is used in the engineering sector, often in the form of an alloy material such as brass and bronze.

Lead. A large proportion of the lead produced is used in the production of automobile and commercial vehicle batteries and for industrial load-levelling uses. Over three quarters of all lead consumed is by lead-acid batteries of one kind or another, mostly in starting, lighting and ignition (SLI) applications. Other uses include cable sheathing, pipe and sheet, chemicals (such as PVC and in glass for lighting and TV tubes) and alloys.

Base metals global market share by value, five-year average



Source: WBMS, ILZSG, LME

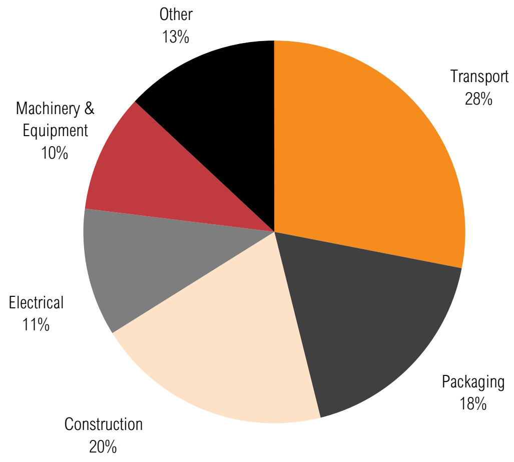
Nickel. Nickel-containing alloys and steels are highly resistant to corrosion and oxidation and provide both strength and toughness at high temperatures. The major use for nickel is in the production of stainless steels, which accounts for more than 65% of total world nickel consumption. Other uses for nickel include rechargeable batteries, alloy steels, nickel alloys, copper alloys, castings, plating and chemicals. Pure nickel metal or nickel alloyed with other metals (normally copper) is also used in coinage.

Tin. By far the largest market for tin is for solders, electrical and electronic, as well as traditional engineering and plumbing. Tin has benefited from the move to lead-free solders. Other uses include tinplate for food and beverage cans, various chemicals including fire retardants, and bronze.

Zinc. There are a number of major markets for zinc consumption. Zinc is used in coatings for protection against iron and steel corrosion, zinc alloys for casting and as an element of alloys such as brass. It is also required in sheet form for roofing and the cladding of buildings, and tyres in the form of zinc oxide.

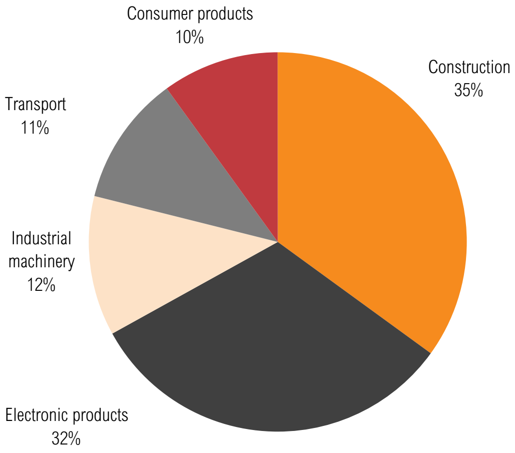
Base metals offtake by key end-use sectors

Aluminium – 2009 global consumption = 34.65mt



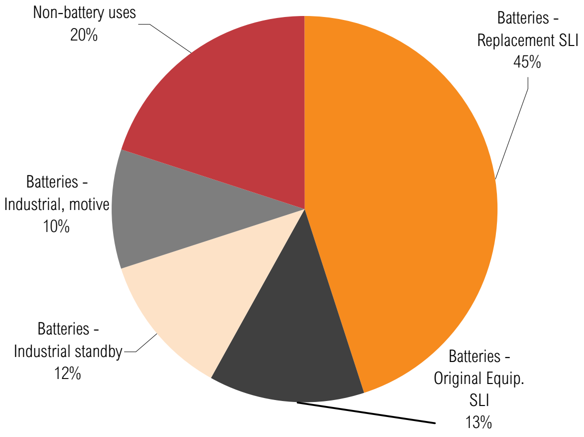
Source: CRU

Copper – 2009 global consumption = 16.65mt



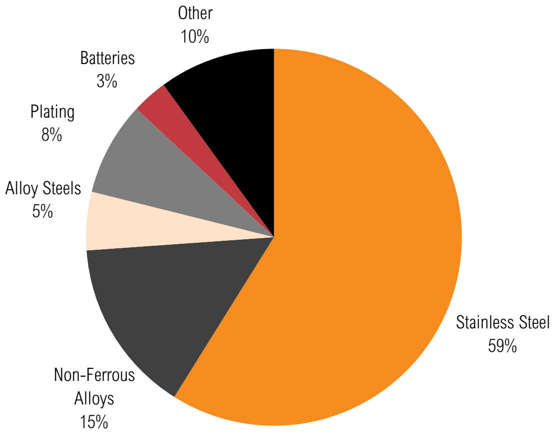
Source: Brook Hunt

Lead – 2009 global consumption = 8.20mt



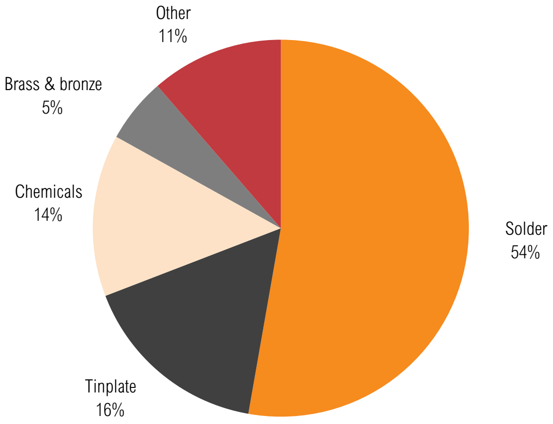
Source: CRU

Nickel – 2009 global consumption = 1.24mt



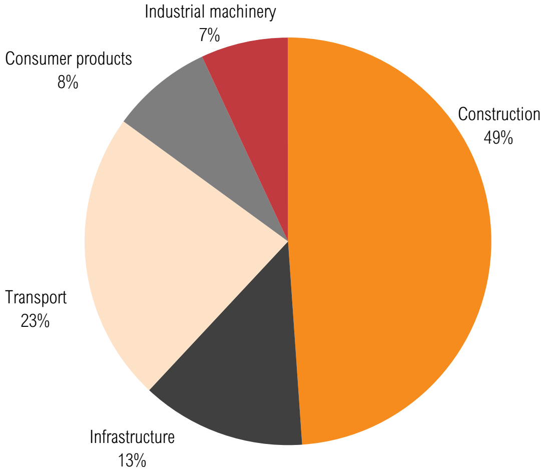
Source: CRU

Tin – 2009 global consumption = 0.32mt



Source: ITRI

Zinc – 2009 global consumption = 10.50mt



Source: Brook Hunt

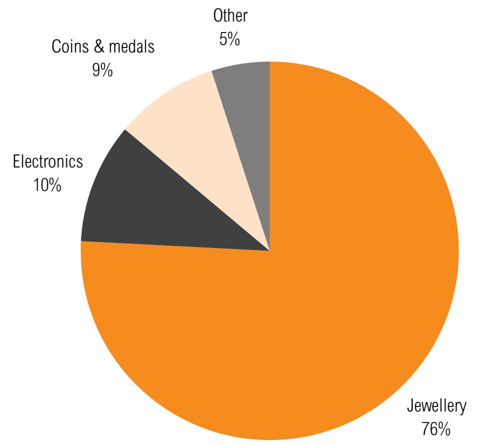
Precious metals offtake by key end-use sectors

Gold. Historically, governments used gold to back and underpin their currencies. Central banks do, however, still hold substantial reserves of gold totalling nearly 30,000 tonnes and worth around US$830bn. Gold is mostly used in the jewellery sector (serving large markets such as India and China), with other uses in the electronics industry, dentistry, coinage/medals sectors and decorative industries. Gold is also used as a safe haven and portfolio diversifier by financial institutions, with a range of listed physically backed ETFs.

Silver. There are some primary silver mines, but silver tends to be extracted as a by-product from lead-zinc, copper or gold mining. Its end uses include photography, jewellery and silverware, and industrial and decorative products.

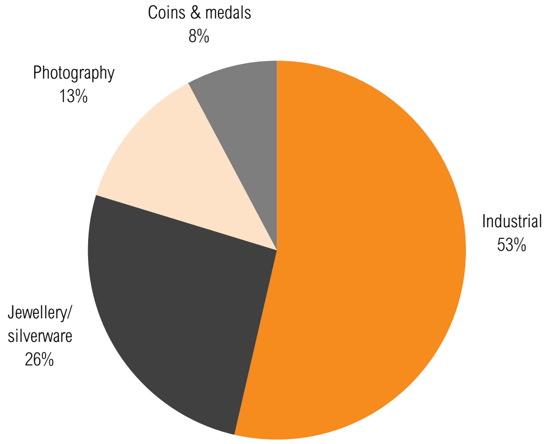
Platinum group metals. Platinum, palladium and rhodium are used in the automotive industry for the production of vehicle exhaust emission-cleaning autocatalysts. Palladium is favoured for gasoline engine vehicles and platinum for diesel. Jewellery also accounts for a sizeable proportion of platinum and palladium offtake. Other uses include dentistry, electricals, chemical and electrochemical industries and investment (coinage/medals).

Gold – 2008 global metal fabrication = 2,850t



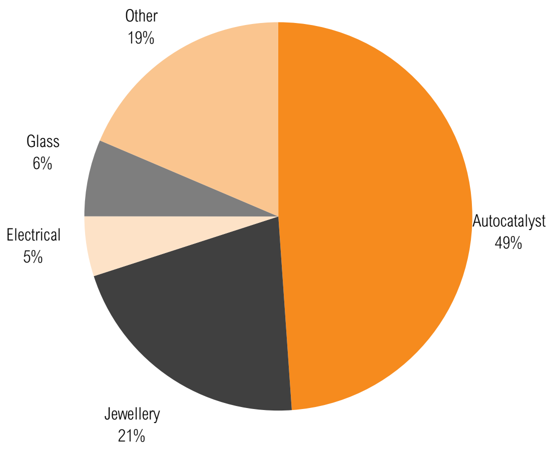
Source: GFMS Gold Survey – 2009

Silver – 2008 global metal fabrication = 25,896t



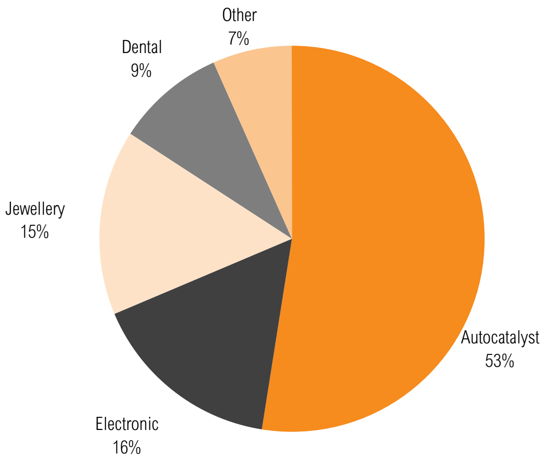
Source: GFMS Silver Survey – 2009

Platinum – 2008 global consumption = 242t



Source: GFMS Platinum & Palladium Survey 2009

Palladium – 2008 global consumption = 261t



Source: GFMS Platinum & Palladium Survey 2009

A simple guide to commodity indices

Indices are designed to be a benchmark for the performance of the commodity sector as a whole or for a particular sub-sector of the market. Returns are based on a weighted basket of underlying commodity futures, with positions usually taken in the front month contracts due to greater liquidity. However, differing indices will have differing methodologies that may have an impact on performance.

Key commodity index components

Returns to commodity investors comprise three components. The first is the absolute price performance of the underlying futures contracts of the index components. This is referred to as the **spot index** performance and is a useful indicator of spot price trends and momentum in the commodity markets. Analysing the spot index performance of sub-indices of the major commodity indices (S&P GSCI, DJ-AIG and R/J CRB) is useful in identifying the leading and lagging sectors within the commodity markets.

The **excess return index** is a combination of changes in the spot index and the accumulated roll yield since inception of the index. As each front month future approaches expiry, it needs to be 'rolled' into the next nearby contract on a pre-determined day of the month to maintain exposure to changes in the underlying commodity future. This would involve, for example, selling the maturing June contract and purchasing an equivalent position in the July contract. The roll yield is the difference between the price at which the front month future is sold and the second future is bought.

Whether the roll yield is positive or negative will depend upon the shape of the forward curve. A downward sloping or 'backwardated' forward curve will lead to a positive roll yield, as shown in the next chart. Conversely, if the forward curve is upward sloping or in 'contango', the return from rolling will be negative. The angle of the front end of the forward curve will determine the size of the roll yield.

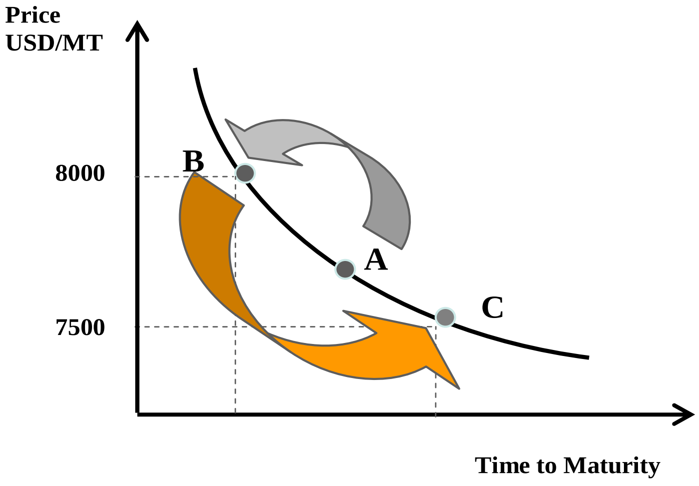
1. Investor holds the first nearby futures contract (point A)

2. As the contract approaches maturity, it rolls up the curve, appreciating in price

3. Immediately prior to expiry, the front month contract is sold (point B) and the next nearby contract bought (point C)

4. Positive roll yield of US$500 is generated by the margin between the prices at which the two futures contracts are bought and sold

Example of how a backwardated forward curve generates a positive roll yield



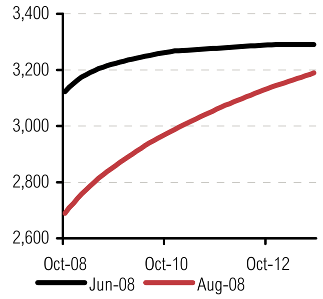
Source: RBS

The **total return** assumes a fully collateralised investment is made up of the excess return plus a return on collateral at a risk-free rate, generally the US Treasury bill return. Should the price of the basket of commodities decline in between roll periods, the collateral put up by an investor in a fully collateralised index product will be consumed in margin payments for the basket of futures contracts, reducing the accrued interest and resulting total return.

Generally, investment can be made in both the excess return and total return indices. The spot index is usually more theoretical, as exposure to underlying commodity cannot be achieved without taking out futures contracts and therefore being exposed to positive or negative roll yields. However, spot indices provide a good benchmark for tracking price trends in differing commodity sub-sectors and comparing commodities with other asset classes as it removes bias from positive and negative roll yields.

Commodity forward curves – contango and backwardation

LME aluminium forward curve in contango



Source: LME

Commodity forward curves are a representation of where the market is pricing an underlying asset for delivery at a given date in the future. The curve is the construct of a set of individual exchange-traded forward contracts, often at monthly intervals.

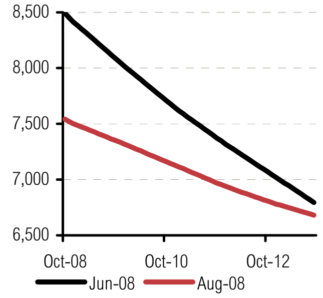
As most trading occurs in nearby futures contracts, the front end of the curve is increasingly influenced by speculative investor flows. The back end of the curve is usually far more stable in commodity markets, driven by more predictable producer hedging activity, acting as a pivot while flows at the front end determine the slope and curvature.

A **contango** market is a situation where the nearby price is lower than the forward price, reflecting the time value of money and the cost of carrying the physical material.

Backwardation is a situation where the nearby price is higher than the forward price; this may reflect a situation of short-term supply tightness inflating the nearby price.

Reweighting, rebalancing and the rolling of contracts

LME copper forward curve in backwardation



Source: LME

The varying commodity indices have different methodologies used in the calculation of index returns and resulting returns to investors. It is important to identify some key terms that are used in distinguishing between these different methodologies.

Index reweighting is the process in which the target weights of individual components within the index are reviewed. This may include the number of commodities, the individual futures contracts and the target weighting that each futures contract will have. The criterion used to determine the weighting of components within the index tends to be focused around the relative value of components or the liquidity of futures contracts.

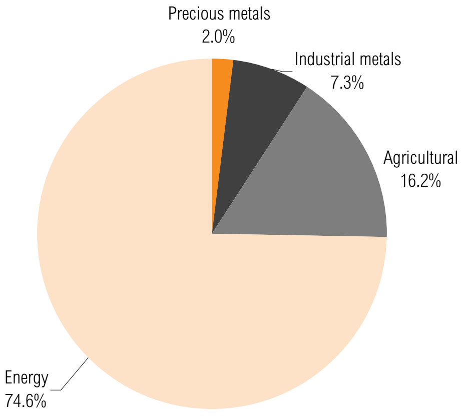
Index rebalancing is when the individual components of an index are reset to their target weights. When an index is rebalanced, components that have outperformed will have their weighting reduced, and those that have underperformed will have their weighting increased.

Rolling contracts: the regularity of rolling and the position on the forward curve that a contract is rolled will have an impact on the index roll yield. The more regularly contracts are rolled, the more accentuated the positive or negative yield will be. Therefore, indices dominated by components that are in backwardation will benefit from more regular rolling of contracts.

Commodity index weightings by sector and contract

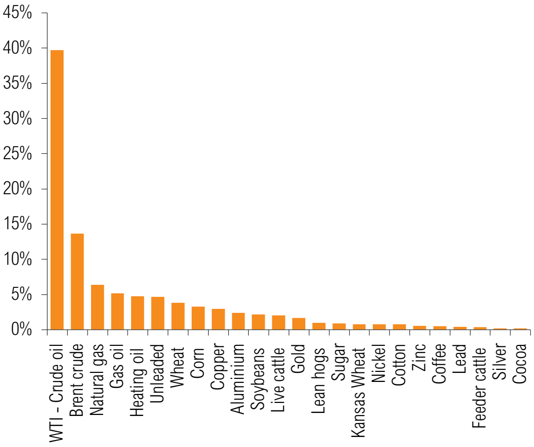
S&P Goldman Sachs commodity index – (S&P GSCI)

S&P GSCI index weighting by sector



Source: Bloomberg, RBS

S&P GSCI index weighting by contract



Source: Bloomberg, RBS

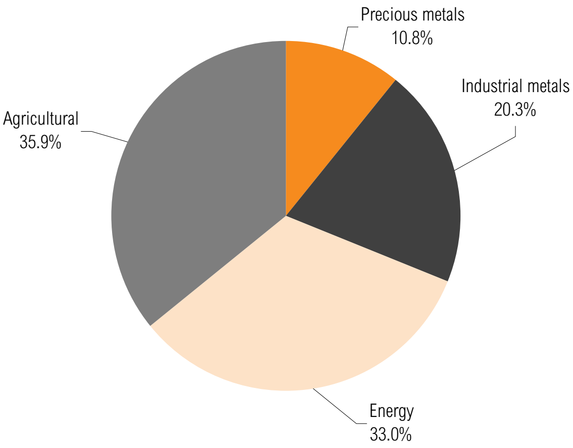
Determining weighting

The S&P GSCI is primarily weighted on a world production basis. Weightings are reviewed relative to the value of individual components calculated using an average quantity of production and market value, as per the last five years of available data. Revisions to the index's component weightings become effective in January.

The GSCI is **rebalanced annually**, in early January, and contracts are **rolled on a monthly basis**.

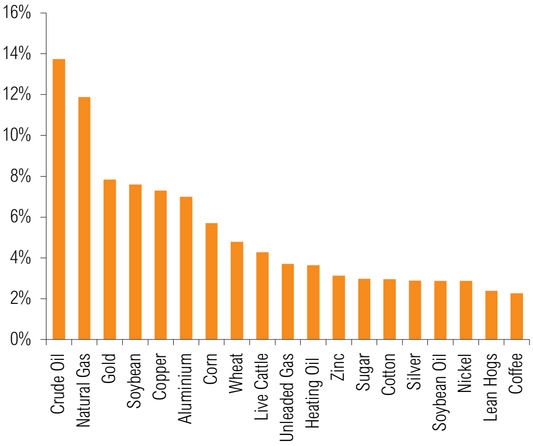
Dow Jones – UBS Commodity Index – (DJ-UBSCI)

DJ-UBS Commodity Index weighting by sector



Source: UBS

DJ-UBS Index weighting by contract



Source: UBS

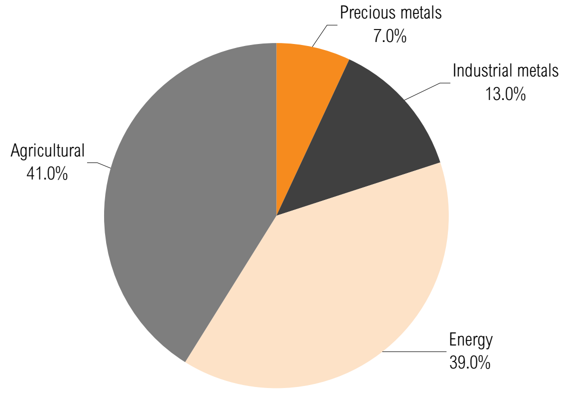
Determining weighting

The main factor for determining index weighting is liquidity of the individual futures contracts; a secondary consideration is the US dollar-adjusted global production of each component. Both calculations are averaged over five years. Other rules are meant to ensure that diversity is maintained; no related group can constitute more than 33% of the index and no individual component can constitute less than 2% or more than 15%. Revisions to the index's component weightings are decided in August and become effective in January.

The index is **rebalanced annually**, in early January, and individual contracts are **rolled six times annually**.

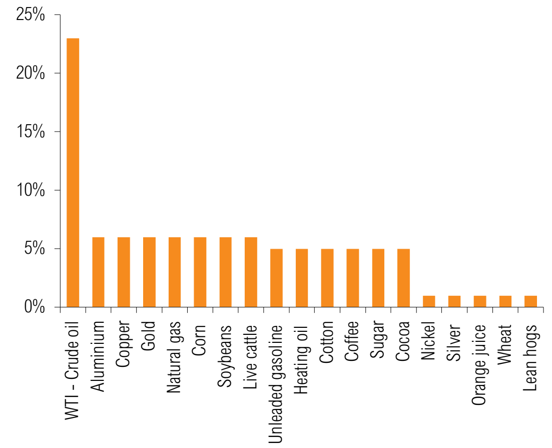
Reuters/Jefferies CRB index (R/J CRB)

Reuters/Jefferies CRB index weighting by sector



Source: Bloomberg, RBS

Reuters/Jefferies CRB index weighting by contract



Source: Bloomberg RBS

Determining weighting

Unlike other indices that have their target weightings reviewed regularly, most commonly on an annual basis, the RJ/CRB's target weighting has been revised 10 times in 50 years, with its last revision being in 2005.

The R/JCRB index employs equitable distribution wherever feasible while reweighting exposure to selected markets, such as the economically important energy sector. The index is designed to be liquid and rational.

Rebalanced monthly. The index is reset to its target weightings every month. Monthly rebalancing increases transparency, reducing exposure to commodities that have traded higher, and increasing exposure to relatively inexpensive commodities.

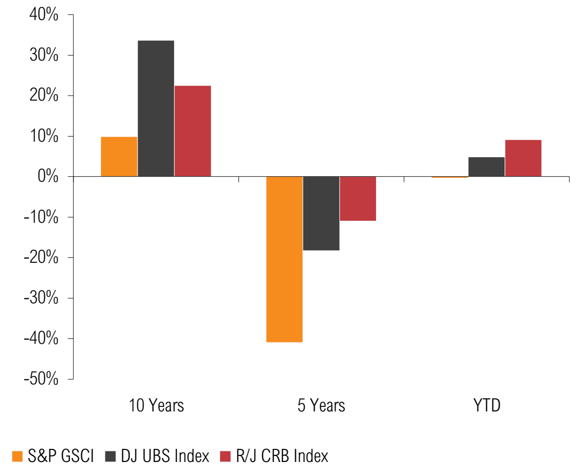
Roll frequency. This is variable depending on the category of commodity and its liquidity. Unlike other indices, contracts are rolled at numerous positions on the forward curve depending on liquidity to reduce exposure to steeper contangos close to expiry. Contracts are rolled using a four-day rollover schedule for each commodity, beginning on the first business day of each month.

Commodity indices – negative roll reduces returns

After a period of stabilisation in Q1 09, the commodity complex has been one of the key beneficiaries of the resurgence in appetite for risk across the investment community in Q2 and Q3 09. Investor outflows undoubtedly exacerbated the decline in commodity prices in 2008, but demand for commodity products including the commodity indices returned in early 2009, and has almost certainly been one of the key factors driving the impressive recovery in commodity prices.

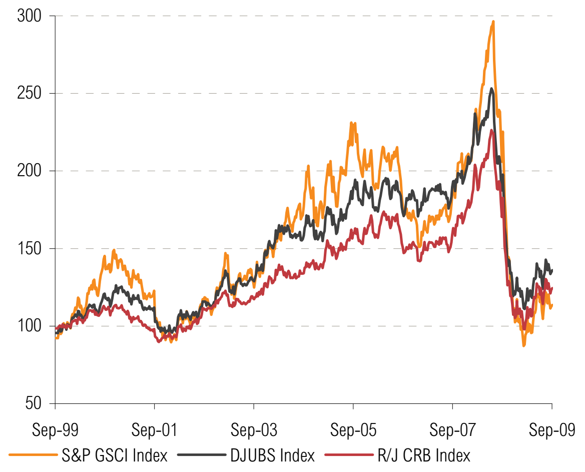
The Q2/Q3 09 risk rally has been broad-based, with many asset classes posting impressive gains from their lows, but few more impressive than a number of the commodity heavyweights such as WTI crude oil up 80% and copper up more than 100%. However, gaining exposure to commodities is not as easy in other asset classes because investors tend to not want physical delivery of various commodities, exposing them to negative roll yield. Negative roll yield has been a major drag on the commodity indices in 2009, with the GSCI index up 28% from its low, the DJ UBS index up 21% and the R/J CRB index up 25%.

Commodity indices excess return over varying time periods (excess return includes cumulative roll yield)



Source: Bloomberg, RBS

Commodity indices 10-year excess return – Sept 1999 = 100 (excess return includes cumulative roll yield)



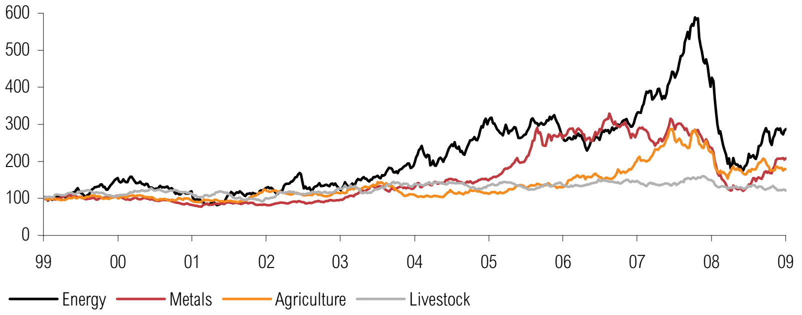
Source: Bloomberg, RBS

The differing component weighting and methodologies of the three key benchmark indices have produced varying excess returns. The key difference is the large exposure of the GSCI to the energy sector with an allocation of more than 50% to crude oil. This provided greater returns during the recent bull market, but also greater volatility and exposure to positive and negative roll yield.

Metals lead the commodity recovery in 2009

Although the GSCI has a heavy energy weighting, individual **spot** sub-indices offer an indication of the relative performance of the major commodity sectors.

S&P GSCI spot sub-indices – 10-year performance (indexed September 1999 = 100)

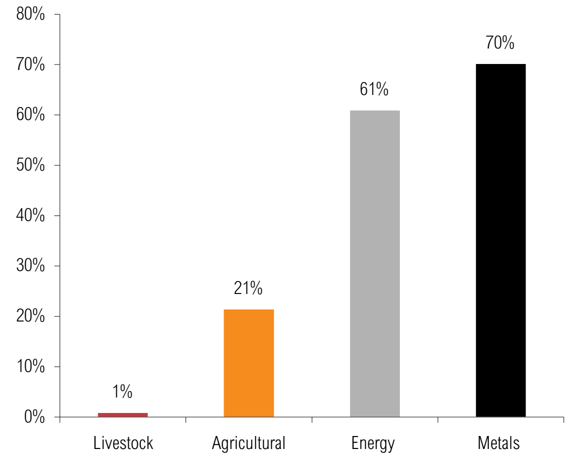


Source: Bloomberg, RBS

Over the past 10 years, the energy sector has been the best performer of the major commodity sub-sectors. Despite the sharp decline in energy prices during H2 08, the GSCI energy sub-index is up more than 180% in 10 years, relative to metals (up 108%), agriculture (up 79%), and livestock (up 21%).

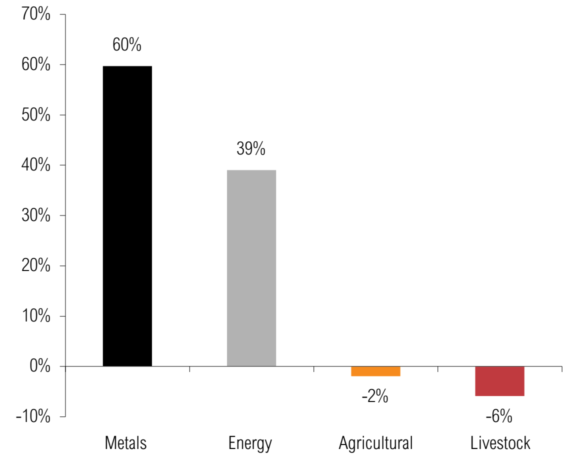
Over the past five years the GSCI agriculture sub-index has been the top performer, gaining 65%. This is largely because it did not suffer the same losses seen in more volatile commodity sub-sectors in H2 08. The GSCI metals sub-index has gained 58% over five years, followed by energy, up 45%. The livestock sub-index has declined 13% over five years.

GSCI sub-indices, percentage moves from recent trough levels



Source: Bloomberg, RBS

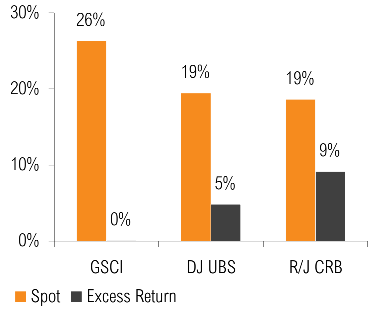
GSCI spot sub-indices, percentage moves, 2009 ytd



Source: Bloomberg, RBS

Industrial metals are the most economically geared of the commodities, followed by energy. Demand for agricultural commodities has far less medium-term economic gearing, and the agriculture and livestock sub-sectors tend to benefit less from investor flows. Metals have led the 2009 recovery in commodity prices, followed by energy, with the GSCI sub-indices advancing 60% and 39%, respectively. Meanwhile, the agricultural and livestock sub-indices have declined 2% and 6% year-to-date, respectively. Although the agriculture and livestock sectors previously suffered less severe losses than those of metals and energy, the divergence in price performance year-to-date suggests commodity investors are positioning themselves to gain maximum leverage to an upturn in physical demand.

YTD spot and excess returns of the benchmark commodity indices



Source: Bloomberg, RBS

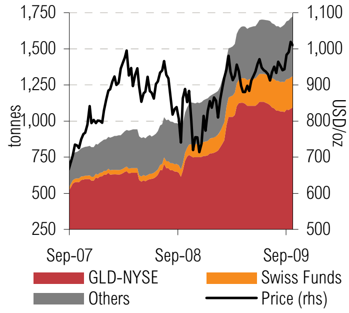
Negative roll yields limit commodity index returns in 2009

Although many of the commodity heavyweights have enjoyed impressive spot price gains in 2009, passive investors have struggled to capture these gains through commodity indices due to the impact of negative roll yield. During the last bull market, tight physical conditions resulted in backwardated forward curves for many key commodities (notably crude oil), benefiting index investors.

Commodity price gains in 2009 have been impressive, but they have been driven more by financial flows rather than tightness in the physical market. This has meant that the forward curves of most commodities have remained in steep contango, producing damaging negative roll yields for index investors.

Comparing the spot and excess returns (including cumulative roll yield) of the benchmark commodity indices year-to-date shows the impact of negative roll yield (see chart at left). We continue to see negative roll yield as a concern for investors seeking to gain exposure to commodities through the indices.

ETF gold holdings vs US dollar-denominated gold price



Source: WGC, RBS

Precious metal ETFs – stabilisation

In H2 08 and Q1 09, the precious metal ETFs, most notably gold, took centre stage in the precious metals arena, enjoying record inflows as investors looked for safety in real assets and to the 'safe haven' properties of the precious metals.

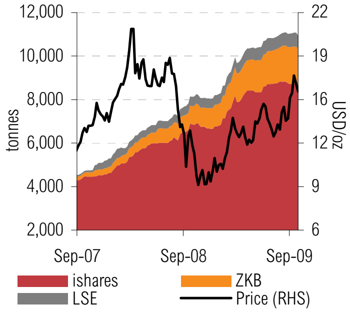
As the risk rally absorbed the financial community in Q2 and Q3 09, one might have expected investors to move out of these instruments as risk appetite improved, but this was not the case. Despite periods of modest net redemptions from the precious metals ETFs during Q2 and Q3, holdings in all of the funds, bar silver, stood at record levels in late September 2009.

It has become the consensus view that the worst is over and the world economy will return to growth in 2010, yet investors are still holding a near-record $55bn in ETFs of gold, the 'asset of last resort'. In our view, this demonstrates that gold's 'safe haven' properties are not its only attraction to investors. The resilience of the gold ETFs during the risk rally of Q2 and Q3 09 suggests that if investors have learned anything from the financial crisis, it is the value of portfolio diversity.

We believe that the desire for greater portfolio diversity as well as the desire for exposure to real assets, partly as a hedge against potential inflation, will be key factors that will underpin further growth in the precious metal ETFs in the future.

Gold ETF holdings have increased by 536t (45%) so far in 2009, and currently stand at a record 1,725t. Inflows so far in 2009 are 68% higher than the 318t of inflows seen in the whole of 2008, and account for 15% of 2008 global demand. Total ETF value has risen by US$22bn (66%) in 2009 to US$55bn. 59% of total growth in gold holdings so far in 2009 has been in the SPDR ETF, which accounts for 63% of total holdings. However, the majority of these inflows came in Q1 09, and after peaking in June there has been a net 38t of redemptions from the SPDR ETF. These redemptions have been offset by growth in the smaller funds, most notably the increasingly popular Swiss ETFs. Holdings in the ZKB gold fund have risen 52% year-to-date and it is now, at over 150t, the second-largest gold ETF, while the Julius Baer fund has surged from 9t to 65t YTD.

12 month silver ETF holdings vs US$-denominated gold price



Source: iShares, ETF Securities, ZKB, RBS

Silver ETF holdings have increased by 2,694t (33%) year-to-date, to 10,947t, and their value has increased by US$2.8bn (99%), benefiting from a 50% YTD increase in the silver price. Silver's fundamental position remains a little shaky, with the market likely to sustain a significant surplus this year, largely as a result of weak industrial demand. However, so far in 2009, robust investment demand, especially in ETFs, has been more than able to absorb this excess material.

Platinum ETF holdings have risen by 8.2t (89%) year-to-date, to a record 17.4t, and their value has increased by US$450m (169%), supported by a 42% increase in the platinum price. The platinum funds are the only family of precious metal ETFs that suffered significant redemptions in H2 08, when prices fell. After a volatile H1 09 in which holdings fluctuated broadly in line with changes in the platinum price, holdings were stable in July-August, picking up in September.

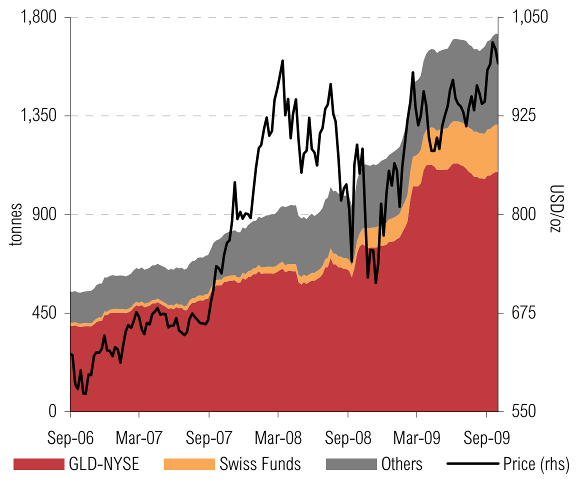
Palladium ETF holdings have increased by 13.2t (64%) year-to-date, to a record 33.8t, and their value has increased by US$197m (162%) to a total of US$318m.

Precious metal ETF summary (end-period values)

	Volume – tonnes						Value – US$m					
	2006	**2007**	**2008**	**2009 ytd**	**% chg ytd**	**% of total**	**2006**	**2007**	**2008**	**2009 ytd**	**% chg ytd**	**% of total**
Gold	621	872	1,189	1,725	45%	14%	12,622	23,362	33,078	54,979	66%	89%
Silver	3,768	5,297	8,253	10,947	33%	86%	1,563	2,514	2,863	5,702	99%	9%
Platinum	-	6.0	9.2	17.4	89%	0.1%	-	297	267	717	169%	1.2%
Palladium	-	8.7	20.6	33.8	64%	0.3%	-	102	121	318	162%	0.5%
Total	**4,389**	**6,183**	**9,472**	**12,723**	**34%**	**100%**	**14,185**	**26,275**	**36,329**	**61,716**	**70%**	**100%**

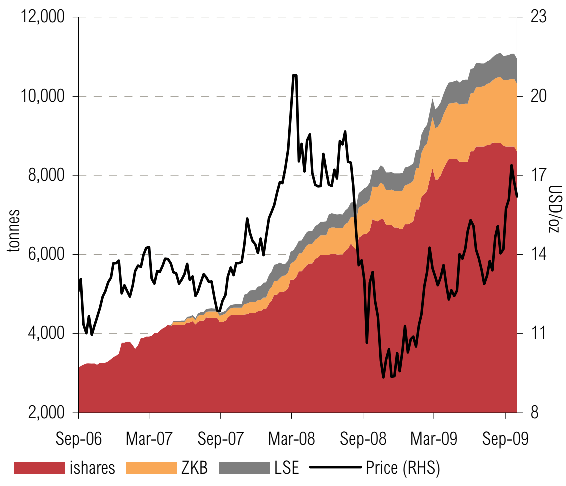
Source: ETF Securities, Zurcher Kantonalbank, iShares, WGC, LBMA, LPPM

Gold – ETF holdings and spot price – US$55bn



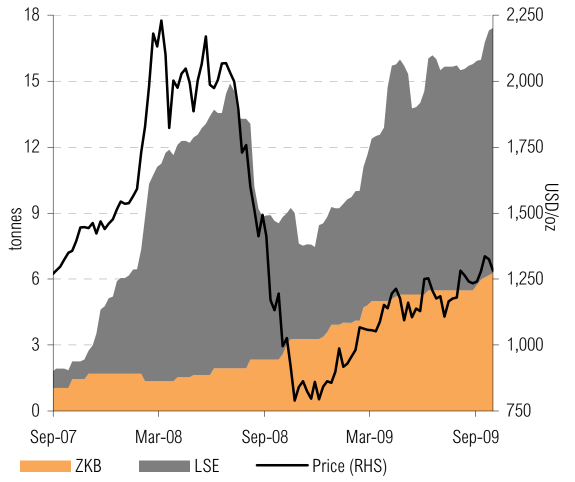
Source: WGC, LBMA

Silver – ETF holdings and spot price – US$5.7bn



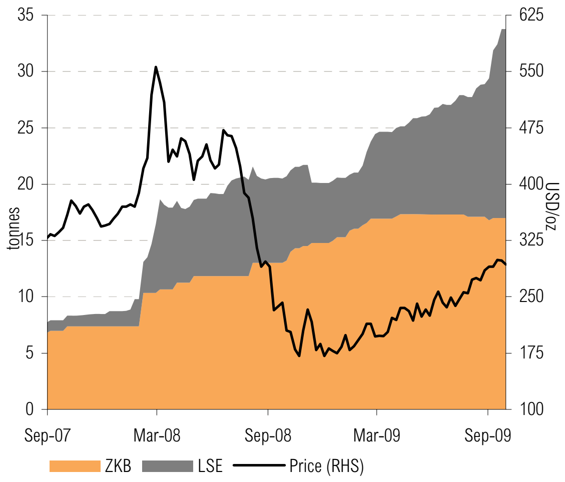
Source: ETF Securities, Zurcher Kantonalbank, iShares, LBMA

Platinum – ETF holdings and spot price – US$0.72bn



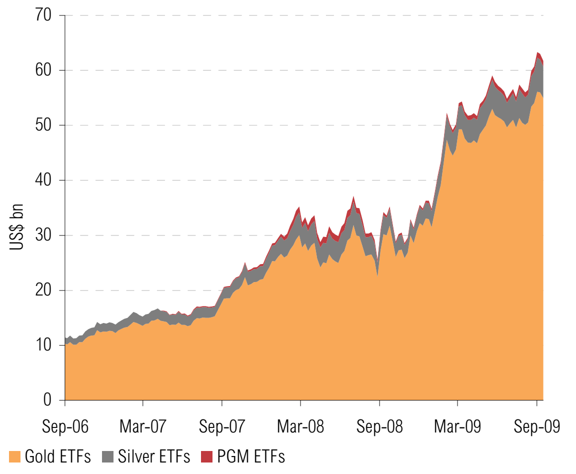
Source: ETF Securities, Zurcher Kantonalbank, LPPM

Palladium – ETF holdings and spot price – US$0.32bn



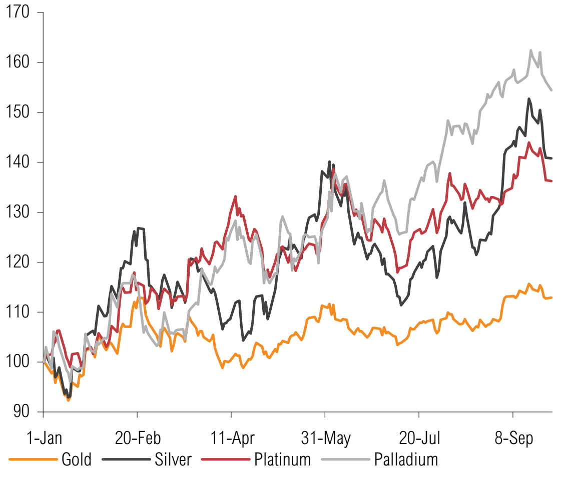
Source: ETF Securities, Zurcher Kantonalbank, LPPM

Value of total ETF holdings – US$62bn



Source: ETF Securities, Zurcher Kantonalbank, iShares, WGC, LBMA, LPPM

Precious metal prices (indexed Jan 2009)



Source: LBMA, LPPM

Aluminium – five-year global historical view of top producers and consumers

Global alumina production ranked by 2008 output (000 tonnes)

					Top 5 =	86%		Jan-Jun		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	6,994	8,510	13,696	19,456	22,784	27%	*30.1%*	11,129	10,610	*-4.7%*
Oceania	16,975	17,920	18,607	19,249	19,728	24%	*3.3%*	9,722	9,883	*1.7%*
Latin America	13,076	13,188	14,872	15,111	15,768	19%	*4.8%*	7,576	6,838	*-9.7%*
Western Europe	6,377	6,560	6,748	6,809	6,951	8%	*2.6%*	3,466	2,252	*-35.0%*
North America	6,887	6,928	6,799	6,076	6,160	7%	*0.2%*	3,175	1,735	*-45.4%*
Asia	5,397	5,395	5,364	5,564	5,993	7%	*3.0%*	3,041	2,994	*-1.5%*
East/Central Europe	5,381	5,430	5,475	5,528	5,301	6%	*0.4%*	2,681	2,266	*-15.5%*
Africa	779	736	530	526	595	1%	*-4.0%*	273	272	*-0.4%*
Global total	**61,866**	**64,667**	**72,091**	**78,319**	**83,280**	**100%**	***7.2%***	**41,063**	**36,850**	***-10.3%***
Change %	*5.4%*	*4.5%*	*11.5%*	*8.6%*	*6.3%*			*Change*	*-4,213*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics and IAI – September 2009

Global refined aluminium metal production ranked by 2008 output (000 tonnes)

					Top 5 =	63%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	6,689	7,806	9,358	12,559	13,177	34%	*18.9%*	7,788	6,616	*-15.0%*
Russia	3,594	3,647	3,718	3,955	3,800	10%	*1.8%*	2,217	2,151	*-3.0%*
Canada	2,592	2,894	3,051	3,083	3,119	8%	*2.2%*	1,814	1,768	*-2.5%*
US	2,517	2,480	2,281	2,560	2,659	7%	*-0.3%*	1,599	1,055	*-34.0%*
Australia	1,895	1,903	1,932	1,959	1,974	5%	*1.2%*	1,143	1,133	*-0.9%*
Brazil	1,457	1,498	1,604	1,655	1,661	4%	*3.8%*	965	900	*-6.7%*
Norway	1,322	1,377	1,427	1,357	1,359	3%	*2.7%*	792	654	*-17.4%*
India	861	942	1,105	1,222	1,308	3%	*10.4%*	742	854	*15.2%*
South Africa	864	851	887	898	811	2%	*2.0%*	477	632	*32.6%*
UAE	683	850	789	890	892	2%	*10.7%*	548	542	*-1.1%*
Others	7,462	7,769	7,823	7,970	8,507	22%	*4.0%*	4,974	4,261	*-14.3%*
Global total	**29,936**	**32,017**	**33,975**	**38,108**	**39,265**	**100%**	***7.0%***	**23,058**	**20,566**	***-10.8%***
Change %	*6.9%*	*7.0%*	*6.1%*	*12.2%*	*3.0%*			*Change*	*-2,492*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Global refined aluminium metal consumption ranked by 2008 consumption (000 tonnes)

					Top 5 =	62%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	6,043	7,119	8,648	12,347	12,413	34%	*19.1%*	7,247	7,802	*7.7%*
USA	5,800	6,114	6,150	5,545	4,906	13%	*-2.8%*	3,069	2,253	*-26.6%*
Japan	2,319	2,276	2,323	2,197	2,250	6%	*0.1%*	1,350	790	*-41.5%*
Germany	1,795	1,759	1,823	2,008	1,950	5%	*0.3%*	1,217	619	*-49.1%*
India	861	958	1,080	1,207	1,284	3%	*10.0%*	772	762	*-1.4%*
Russia	1,020	1,020	1,047	1,020	1,020	3%	*4.9%*	595	595	*0.0%*
South Korea	1,118	1,201	1,153	1,081	964	3%	*-0.4%*	637	540	*-15.2%*
Italy	987	977	1,021	1,087	951	3%	*-0.1%*	613	359	*-41.4%*
Brazil	651	759	773	854	932	3%	*9.6%*	546	403	*-26.2%*
Canada	755	801	846	718	714	2%	*-0.6%*	407	347	*-14.8%*
Others	8,617	8,704	9,090	9,497	9,638	26%	*4.5%*	5,855	4,797	*-18.1%*
Global Total	**29,965**	**31,689**	**33,954**	**37,561**	**37,020**	**100%**	***6.0%***	**22,308**	**19,268**	***-13.6%***
Change %	*8.5%*	*5.8%*	*7.1%*	*10.6%*	*-1.4%*			*Change*	*-3,040*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Copper – five-year global historical view of top producers and consumers

Global copper mine production ranked by 2008 output (000 tonnes)

					Top 5 =	64%		Jan-May		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
Chile	5,413	5,321	5,361	5,557	5,331	34%	*1.7%*	2,207	2,110	*-4.4%*
USA	1,174	1,157	1,222	1,194	1,336	9%	*3.4%*	519	504	*-2.9%*
Peru	1,036	1,010	1,049	1,190	1,268	8%	*8.0%*	502	520	*3.5%*
China	754	777	889	946	1,023	7%	*10.7%*	413	363	*-12.2%*
Australia	854	916	859	871	884	6%	*1.0%*	352	336	*-4.4%*
Russian Federation	630	640	675	690	705	5%	*1.6%*	291	298	*2.2%*
Indonesia	843	1,065	816	789	651	4%	*-8.3%*	226	430	*90.0%*
Canada	563	596	603	596	607	4%	*1.7%*	241	243	*1.0%*
Zambia	402	433	474	509	546	4%	*7.6%*	215	229	*6.6%*
Poland	531	512	497	452	429	3%	*-3.2%*	178	185	*4.1%*
Others	2,395	2,498	2,545	2,670	2,681	17%	*3.0%*	1,074	1,133	*5.6%*
Global total	**14,594**	**14,924**	**14,990**	**15,465**	**15,458**	**100%**	***2.4%***	**6,218**	**6,352**	***2.2%***
Change %	*6.1%*	*2.3%*	*0.4%*	*3.2%*	*-0.0%*			*Change*	*134*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – August 2009

Global refined copper production ranked by 2008 output (000 tonnes)

					Top 5 =	58%		Jan-May		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	2,199	2,600	3,003	3,499	3,791	21%	*15.6%*	1,550	1,611	*3.9%*
Chile	2,837	2,824	2,811	2,936	3,060	17%	*1.1%*	1,221	1,349	*10.5%*
Japan	1,380	1,395	1,532	1,577	1,540	8%	*1.5%*	638	580	*-9.1%*
United States	1,306	1,255	1,250	1,311	1,267	7%	*-0.6%*	529	483	*-8.6%*
Russian Federation	919	935	951	949	862	5%	*0.5%*	356	337	*-5.5%*
Germany	653	638	662	666	694	4%	*3.1%*	288	275	*-4.6%*
India	405	493	625	715	675	4%	*11.6%*	281	299	*6.5%*
South Korea	496	519	576	582	537	3%	*1.0%*	219	203	*-7.3%*
Poland	550	560	557	533	527	3%	*-0.1%*	217	200	*-7.7%*
Canada	527	515	501	454	444	2%	*-0.5%*	209	154	*-26.2%*
Others	4,656	4,838	4,827	4,722	4,849	27%	*1.6%*	1,969	1,935	*-1.7%*
Global total	**15,928**	**16,573**	**17,295**	**17,944**	**18,245**	**100%**	***3.6%***	**7,476**	**7,425**	***-0.7%***
Change %	*4.3%*	*4.0%*	*4.4%*	*3.8%*				*Change*	*-51*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – August 2009

Global refined copper consumption ranked by 2008 consumption (000 tonnes)

					Top 5 =	58%		Jan-May		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	3,381	3,652	3,604	4,957	5,199	29%	*10.9%*	2,091	3,001	*43.5%*
US	2,415	2,274	2,130	2,137	1,952	11%	*-3.2%*	879	693	*-21.2%*
Germany	1,121	1,180	1,398	1,392	1,365	8%	*6.2%*	581	435	*-25.1%*
Japan	1,279	1,223	1,282	1,252	1,184	7%	*-0.3%*	515	308	*-40.2%*
South Korea	937	864	812	821	780	4%	*-3.0%*	331	370	*11.5%*
Russian Federation	588	635	692	671	650	4%	*7.8%*	269	164	*-38.8%*
Italy	719	681	801	764	635	4%	*-0.9%*	284	211	*-25.8%*
Taiwan	690	638	639	603	582	3%	*-1.2%*	261	177	*-32.4%*
India	350	415	440	475	500	3%	*10.0%*	202	220	*9.2%*
France	550	505	540	440	410	2%	*-5.4%*	191	105	*-45.2%*
Others	4,811	4,606	4,704	4,663	4,750	26%	*0.6%*	2,054	1,892	*-7.9%*
Global total	**16,840**	**16,673**	**17,042**	**18,175**	**18,007**	**100%**	***2.8%***	**7,659**	**7,575**	***-1.1%***
Change %	*7.2%*	*-1.0%*	*2.2%*	*6.6%*				*Change*	*-84*	

Source: Monthly Bulletin of the International Copper Study Group (ICSG) – August 2009

Nickel – five-year global historical view of top producers and consumers

Global nickel mine production ranked by 2008 output (000 tonnes)

				Top 5=	70%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
Russia	289	289	290	294	287	19%	-1.0%	167	160	-4.2%
Canada	187	200	233	255	260	17%	9.8%	150	108	-28.3%
Australia	187	186	185	185	200	13%	0.9%	116	97	-16.9%
Indonesia	153	156	157	229	193	13%	4.0%	124	99	-20.5%
New Caledonia	118	112	103	125	103	7%	-1.7%	56	48	-14.0%
Philippines	17	29	65	91	84	6%	33.9%	43	105	145.9%
China	76	73	82	66	72	5%	3.2%	40	54	33.4%
Cuba	72	72	74	74	67	5%	0.1%	38	40	4.7%
Colombia	49	53	51	49	42	3%	-2.8%	22	31	46.0%
South Africa	40	42	42	38	32	2%	-5.0%	18	19	10.2%
Others	151	160	163	163	147	10%	-1.8%	91	66	-27.4%
Global Total	**1,339**	**1,371**	**1,445**	**1,570**	**1,484**	**100%**	**2.3%**	**865**	**827**	**-4.4%**
Change %	1.3%	2.4%	5.4%	8.7%	-5.5%			Change	-38	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Global refined nickel production ranked by 2008 output (000 tonnes)

					Top 5=	64%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
Russia	261	268	274	267	260	19%	-0.2%	148	138	-7.1%
China	76	95	132	220	171	13%	21.3%	103	127	23.1%
Canada	152	140	147	154	168	12%	6.2%	97	85	-13.0%
Japan	169	164	152	161	157	12%	-0.8%	94	79	-16.6%
Australia	122	122	116	114	108	8%	-3.5%	69	76	11.1%
Norway	71	85	82	88	89	7%	2.9%	51	49	-4.9%
Finland	50	39	48	55	52	4%	-0.5%	28	32	14.8%
Colombia	49	53	51	49	42	3%	-2.8%	22	31	46.0%
New Caledonia	43	47	49	45	38	3%	-6.0%	21	23	7.1%
Cuba	42	44	44	43	35	3%	-2.1%	20	20	0.0%
Others	216	232	241	250	233	17%	3.3%	141	108	-23.2%
Global Total	**1,251**	**1,288**	**1,336**	**1,445**	**1,351**	**100%**	**2.2%**	**794**	**767**	**-3.4%**
Change %	3.3%	2.9%	3.7%	8.2%	-6.5%			Change	-27	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Global refined nickel consumption ranked by 2008 consumption (000 tonnes)

					Top 5=	59%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2007**	**2008**	**% change**
China	144	197	234	328	305	24%	18.1%	187	342	82.7%
Japan	195	180	181	196	185	14%	-0.3%	114	79	-30.2%
US	128	135	145	119	121	9%	0.7%	77	54	-30.2%
Germany	94	116	106	110	90	7%	-1.1%	50	27	-46.0%
Italy	62	60	68	64	68	5%	-0.9%	43	21	-50.8%
South Korea	123	118	93	71	76	6%	-7.7%	49	48	-2.5%
Taiwan	91	84	107	76	69	5%	-7.7%	45	40	-12.1%
South Africa	45	47	54	44	44	3%	2.0%	30	23	-25.7%
Finland	59	49	51	40	41	3%	-8.8%	28	10	-63.4%
Spain	48	48	53	42	41	3%	-3.2%	26	12	-54.8%
Others	262	262	275	263	257	20%	-1.4%	156	110	-29.1%
Global total	**1,251**	**1,296**	**1,366**	**1,353**	**1,297**	**100%**	**0.8%**	**805**	**766**	**-4.9%**
Change %	0.1%	3.6%	5.4%	-0.9%				Change	-39	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Zinc – five-year global historical view of top producers and consumers

Global zinc mine production ranked by 2008 output (000 tonnes)

					Top 5 =	66%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2009**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	2,391	2,547	2,844	3,048	3,186	27%	9.4%	1,741	1,470	-15.6%
Peru	1,209	1,202	1,202	1,444	1,603	14%	3.2%	917	861	-6.1%
Australia	1,298	1,329	1,338	1,498	1,479	13%	0.4%	868	673	-22.5%
US	739	748	727	803	779	7%	0.3%	477	417	-12.6%
Canada	791	667	638	630	716	6%	-1.9%	413	403	-2.4%
India	355	472	503	558	616	5%	15.1%	359	374	4.2%
Kazakhstan	361	364	410	446	482	4%	4.2%	281	287	2.1%
Mexico	426	476	469	452	464	4%	2.3%	268	302	12.7%
Ireland	438	445	426	401	398	3%	-1.0%	244	236	-3.3%
Bolivia	147	160	173	194	362	3%	20.1%	193	242	25.4%
Others	1,554	1,736	1,714	1,669	1,667	14%	3.0%	971	984	1.3%
Global total	**9,709**	**10,146**	**10,444**	**11,143**	**11,752**	**100%**	**4.3%**	**6,732**	**6,249**	**-7.2%**
yoy change %	2.0%	4.5%	2.9%	6.7%	5.5%			Change	-483	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Global refined zinc production ranked by 2008 output (000 tonnes)

					Top 5 =	48%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	2,720	2,776	3,163	3,743	2,913	25%	4.7%	2,253	2,281	1.2%
Canada	805	724	824	802	764	7%	0.1%	455	386	-15.2%
South Korea	669	647	667	691	739	6%	2.8%	436	432	-0.9%
India	272	302	415	459	606	5%	16.7%	345	392	13.6%
Japan	635	638	614	598	616	5%	-1.1%	371	317	-14.6%
Australia	474	457	466	502	499	4%	-2.0%	292	303	3.8%
Spain	523	500	507	509	466	4%	-2.1%	272	284	4.4%
Kazakhstan	317	357	365	358	366	3%	5.6%	214	189	-11.7%
Mexico	337	336	285	320	321	3%	0.1%	180	183	1.7%
Germany	358	335	317	295	292	2%	-5.5%	175	80	-54.3%
Others	3,282	3,150	3,032	3,089	4,120	35%	5.4%	1,867	1,464	-21.6%
Global total	**10,392**	**10,222**	**10,655**	**11,366**	**11,702**	**100%**	**3.4%**	**6,860**	**6,311**	**-8.0%**
yoy change %	5.2%	-1.6%	4.2%	6.7%	3.0%			Change	-549	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Global refined zinc consumption ranked by 2008 consumption (000 tonnes)

					Top 5 =	58%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	2,690	3,041	3,115	3,597	4,014	35%	13.2%	3,597	4,014	11.6%
US	1,247	1,078	1,153	1,016	990	9%	-3.0%	1,016	990	-2.6%
Japan	623	602	594	588	570	5%	-1.6%	588	570	-3.1%
Germany	514	511	564	535	526	5%	-0.5%	535	526	-1.7%
South Korea	446	476	534	512	507	4%	1.0%	512	507	-1.0%
India	347	388	430	455	490	4%	7.6%	455	490	7.7%
Belgium	365	345	360	387	393	3%	2.3%	387	393	1.6%
Italy	389	395	313	398	281	2%	-4.2%	398	281	-29.4%
France	298	275	285	275	247	2%	-3.2%	275	247	-10.2%
Brazil	242	222	238	248	253	2%	2.6%	248	253	2.0%
Others	3,487	3,278	3,386	3,298	3,210	28%	-0.8%	3,298	3,217	-2.5%
Global total	**10,648**	**10,611**	**10,972**	**11,309**	**11,481**	**100%**	**3.1%**	**11,309**	**11,488**	**1.6%**
yoy change %	8.2%	-0.3%	3.4%	3.1%	1.5%			Change	179	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Lead – five-year global historical view of top producers and consumers

Global lead mine production ranked by 2008 output (000 tonnes)

					Top 5 =	78%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	997	1,142	1,331	1,402	1,543	39%	*10.1%*	868	890	*2.5%*
Australia	642	715	621	589	594	15%	*-1.7%*	343	273	*-20.4%*
US	445	436	429	434	420	11%	*-1.7%*	258	237	*-8.1%*
Peru	306	319	313	329	345	9%	*2.3%*	195	168	*-13.8%*
Mexico	118	135	135	137	145	4%	*0.8%*	81	88	*8.6%*
India	51	60	69	78	84	2%	*13.8%*	49	51	*4.1%*
Canada	77	79	83	75	99	3%	*4.1%*	58	40	*-31.0%*
Sweden	54	60	56	63	77	2%	*9.0%*	45	41	*-8.9%*
Bolivia	10	11	12	20	80	2%	*51.6%*	42	53	*26.2%*
Russia	23	36	34	48	60	2%	*20.1%*	35	37	*5.7%*
Others	408	428	442	432	466	12%	*2.9%*	273	288	*5.5%*
Global total	**3,131**	**3,421**	**3,525**	**3,607**	**3,913**	**100%**	***4.6%***	**2,247**	**2,166**	***-3.6%***
yoy change %	*0.4%*	*9.3%*	*3.0%*	*2.3%*	*8.5%*			*Change*	*-81*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Global refined lead metal production ranked by 2008 output (000 tonnes)

					Top 5=	63%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**%change**
China	1,934	2,391	2,715	2,788	3,206	37%	*15.4%*	1,744	2,139	*22.6%*
US	1,262	1,293	1,303	1,303	1,286	15%	*-1.6%*	749	721	*-3.7%*
Germany	411	418	379	405	415	5%	*3.1%*	253	222	*-12.3%*
UK	243	304	298	275	303	3%	*-1.1%*	180	185	*2.8%*
Japan	283	275	280	276	279	3%	*-1.1%*	276	279	*1.1%*
South Korea	243	256	240	260	270	3%	*3.3%*	158	168	*6.3%*
Australia	273	268	241	238	261	3%	*-3.2%*	151	122	*-19.2%*
Canada	241	230	250	237	259	3%	*3.0%*	149	149	*0.0%*
Mexico	242	256	253	255	255	3%	*1.3%*	149	147	*-1.3%*
Italy	202	211	191	212	200	2%	*-1.3%*	121	93	*-23.1%*
Others	1,664	1,738	1,787	1,883	1,945	22%	*3.7%*	1,044	923	*-11.6%*
Global total	**6,998**	**7,640**	**7,937**	**8,132**	**8,679**	**100%**	***5.1%***	**4,974**	**5,148**	***3.5%***
yoy change %	*3.5%*	*9.2%*	*3.9%*	*2.5%*	*6.7%*			*Change*	*174*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Global refined lead metal consumption ranked by 2008 consumption (000 tonnes)

					Top 5 =	66%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt**	**5 yrs % pa**	**2008**	**2009**	**%change**
China	1,510	1,973	2,213	2,573	3,211	37%	*22.1%*	1,726	2,277	*31.9%*
US	1,502	1,587	1,622	1,510	1,521	18%	*0.1%*	923	820	*-11.2%*
Germany	395	407	387	409	369	4%	*-0.8%*	239	176	*-26.4%*
South Korea	376	384	337	342	312	4%	*-2.2%*	178	164	*-7.9%*
Italy	272	269	285	269	276	3%	*1.4%*	169	132	*-21.9%*
Japan	292	291	303	279	261	3%	*-3.4%*	162	97	*-40.1%*
UK	295	271	270	239	236	3%	*-4.8%*	143	135	*-5.6%*
Spain	246	270	272	260	228	3%	*1.1%*	143	108	*-24.5%*
Mexico	262	267	271	235	215	2%	*-3.7%*	128	113	*-11.7%*
France	215	215	210	210	190	2%	*-2.9%*	117	82	*-29.9%*
Others	1,931	1,869	1,905	1,863	1,830	21%	*0.0%*	1,068	992	*-7.1%*
Global total	**7,296**	**7,803**	**8,075**	**8,189**	**8,649**	**100%**	***4.9%***	**4,996**	**5,096**	***2.0%***
yoy change %	*6.9%*	*6.9%*	*3.5%*	*1.4%*	*5.6%*			*Change*	*100*	

Source: Monthly Bulletin of the International Lead Zinc Study Group – September 2009

Tin – five-year global historical view of top producers and consumers

Global tin mine production ranked by 2008 output (000 tonnes)

					Top 5 =	91%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	118	122	126	147	121	38%	*4.3%*	69	70	*1.6%*
Indonesia	78	120	118	102	96	30%	*8.4%*	59	49	*-16.9%*
Peru	42	42	39	39	39	12%	*-0.6%*	23	22	*-4.4%*
Bolivia	18	19	18	16	17	5%	*1.1%*	10	10	*7.2%*
Brazil	12	12	10	13	15	5%	*4.2%*	9	9	*0.0%*
DRC	6	8	7	12	11	3%	*35.1%*	6	5	*-15.9%*
Russia	3	3	3	2	1	0%	*-27.3%*	1	0	*-42.9%*
Others	14	18	15	18	18	6%	*0.8%*	10	13	*27.3%*
Global total	**291**	**343**	**335**	**350**	**318**	**100%**	***4.5%***	**186**	**178**	***-4.2%***
Change %	*13.8%*	*17.8%*	*-2.2%*	*4.2%*	*-9.0%*			*Change*	*-8*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Global refined tin metal production ranked by 2008 output (000 tonnes)

					Top 5 =	87%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	115	122	132	149	129	39%	*5.6%*	76	72	*-4.5%*
Indonesia	87	78	77	78	70	21%	*2.1%*	44	37	*-14.9%*
Peru	41	38	41	36	38	11%	*-0.6%*	21	21	*0.0%*
Malaysia	34	39	23	26	32	10%	*11.5%*	18	20	*10.3%*
Thailand	21	29	26	18	22	7%	*7.4%*	12	12	*0.8%*
Bolivia	14	16	15	12	12	4%	*5.2%*	7	8	*23.9%*
Brazil	12	9	9	10	11	3%	*-0.6%*	6	6	*-4.8%*
Belgium	9	8	8	8	9	3%	*3.6%*	5	4	*-19.2%*
India	4	4	4	4	4	1%	*0.0%*	2	2	*0.0%*
Russia	4	3	3	3	1	0%	*-25.0%*	1	1	*-37.5%*
Others	4	4	13	7	6	2%	*1.5%*	3	3	*-3.1%*
Global total	**343**	**350**	**351**	**349**	**332**	**100%**	***3.8%***	**195**	**187**	***-4.1%***
Change %	*24.3%*	*1.9%*	*0.5%*	*-0.6%*	*-4.8%*			*Change*	*-8*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Global refined tin metal consumption ranked by 2008 consumption (000 tonnes)

					Top 5 =	66%		Jan-Jul		
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5 yrs % pa**	**2008**	**2009**	**% change**
China	93	116	115	134	128	38%	*12.2%*	73	78	*7.6%*
Japan	33	33	39	34	32	10%	*2.3%*	20	12	*-37.8%*
US	54	42	47	33	26	8%	*-10.2%*	17	18	*4.7%*
Germany	20	19	21	23	21	6%	*-0.2%*	12	8	*-34.4%*
South Korea	16	18	17	16	16	5%	*-1.1%*	10	8	*-23.8%*
Taiwan	13	14	18	13	12	4%	*2.0%*	8	5	*-35.9%*
India	6	8	8	9	9	3%	*5.9%*	5	4	*-15.7%*
France	9	7	8	7	6	2%	*-7.7%*	4	3	*-23.7%*
Others	90	88	91	88	87	26%	*-1.2%*	53	42	*-21.7%*
Global total	**334**	**345**	**363**	**356**	**337**	**100%**	***2.2%***	**202**	**178**	***-11.8%***
Change %	*10.7%*	*3.3%*	*5.2%*	*-1.8%*	*-5.5%*			*Change*	*-24*	

Source: Monthly Bulletin of the World Bureau of Metal Statistics – September 2009

Bulks – five-year global historical view of top producers and consumers

Top 10 iron ore producers and consumers ranked by 2007 market share

Global iron ore production by region (million wet tonnes)

					Top 5 =	88%	5 yrs
Country	**2003**	**2004**	**2005**	**2006**	**2007**	**% Mkt.**	**% pa**
China	261	310	426	588	707	35%	*25.0%*
Brazil	246	271	292	319	355	18%	*9.5%*
Australia	212	235	258	275	299	15%	*9.8%*
India	99	121	143	181	207	10%	*19.1%*
CIS	172	184	184	198	202	10%	*5.0%*
US	49	55	54	53	52	3%	*0.2%*
S Africa	38	39	40	41	42	2%	*2.7%*
Canada	33	29	30	34	32	2%	*1.3%*
Sweden	22	22	23	23	25	1%	*4.0%*
Venezuela	19	20	21	22	23	1%	*1.5%*
Others	64	78	79	85	75	4%	*4.2%*
Global total	**1,214**	**1,363**	**1,550**	**1,820**	**2,019**	**100%**	***12.7%***
Chg %	*9.4%*	*12.3%*	*13.8%*	*17.4%*	*10.9%*		
Chg (mt)	*104*	*149*	*188*	*269*	*199*		

Global iron ore apparent consumption by region (million wet tonnes)

					Top 5 =	77%	5 yrs
Country	**2003**	**2004**	**2005**	**2006**	**2007**	**% Mkt.**	**% pa**
China	420	518	701	914	1,091	54%	*25.2%*
CIS	141	146	145	151	151	7%	*2.9%*
Japan	132	135	132	134	139	7%	*1.5%*
India	43	59	63	92	114	6%	*29.0%*
Brazil	61	70	69	72	66	3%	*3.6%*
US	54	58	56	56	52	3%	*-1.9%*
Germany	39	47	42	45	47	2%	*0.8%*
S Korea	43	45	44	44	47	2%	*1.3%*
Australia	17	16	20	29	34	2%	*17.9%*
France	19	21	20	20	19	1%	*0.4%*
Others	244	249	258	262	259	13%	*2.5%*
Global total	**1,214**	**1,363**	**1,550**	**1,820**	**2,018**	**100%**	***12.7%***
Chg %	*9.4%*	*12.3%*	*13.8%*	*17.4%*	*10.9%*		
Chg (mt)	*104*	*149*	*188*	*269*	*199*		

Source: AME Mineral Economics – August 2008

Top 10 coal producers and consumers ranked by 2008 market share

Global coal* production by region (million tonnes oil equivalent)**

					Top 5 =	78%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	1,012	1,120	1,205	1,282	1,415	43%	*10.3%*
US	572	580	595	587	597	18%	*1.5%*
Australia	198	207	211	219	220	7%	*3.0%*
India	156	162	170	181	194	6%	*6.2%*
Russia	132	139	145	148	153	5%	*3.8%*
RSA	137	138	138	140	141	4%	*1.0%*
Indonesia	81	94	119	134	141	4%	*17.3%*
Poland	70	69	67	62	61	2%	*6.9%*
Kazakhstan	44	44	49	50	59	2%	*-3.8%*
Germany	55	53	50	52	48	1%	*-2.5%*
Others	274	279	287	295	297	9%	*1.8%*
Global total	**2,732**	**2,884**	**3,036**	**3,150**	**3,325**	**100%**	***5.7%***
Chg %	*8.4%*	*5.6%*	*5.3%*	*3.7%*	*5.6%*		
Chg (MTOE)**	*212*	*152*	*152*	*113*	*175*		

Global coal* consumption by region (million tonnes oil equivalent)**

					Top 5 =	7%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	983	1,101	1,215	1,314	1,406	43%	10.5%
US	566	574	566	573	565	17%	0.1%
India	172	184	195	213	231	7%	8.1%
Japan	121	121	119	125	129	4%	2.8%
RSA	95	92	94	98	103	3%	2.9%
Russia	100	94	97	94	101	3%	-0.5%
Germany	85	82	84	86	81	2%	-1.4%
S. Korea	53	55	55	60	66	2%	5.3%
Poland	57	56	58	57	59	2%	0.5%
Australia	53	55	57	56	51	2%	0.5%
Others	481	494	502	519	511	15%	*1.5%*
Global total	**2,766**	**2,907**	**3,042**	**3,195**	**3,304**	**100%**	***4.9%***
Chg %	*6.5%*	*5.1%*	*4.6%*	*5.0%*	*3.4%*		
Chg (MTOE)**	*169*	*141*	*135*	*153*	*109*		

*Commercial solid fuels only – ie bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal.
**1m tonnes of oil or equivalent produces approximately 4,400 gigawatt-hours of electricity in a modern power station.
Source: BP Statistical Review of World Energy – June 2008

Precious metals – five-year historical view of top producers and consumers

Top 10 gold producers and consumers ranked by 2008 market share

Global gold mine (tonnes)							
					Top 5 =	48%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
China	217	230	247	281	292	12%	*6.7%*
US	260	262	252	238	235	10%	*-3.6%*
S. Africa	363	315	296	270	233	10%	*-10.1%*
Australia	258	263	247	246	215	9%	*-5.3%*
Russia	182	175	173	169	189	8%	*0.7%*
Peru	173	208	202	170	180	7%	*0.9%*
Canada	129	120	104	102	96	4%	*-7.3%*
Indonesia	114	165	116	147	95	4%	*-10.4%*
Ghana	58	63	70	77	80	3%	*3.1%*
Uzbeki-stan	84	76	74	75	77	3%	*-0.8%*
Others	657	674	704	703	724	30%	*2.5%*
Global	**2,494**	**2,550**	**2,485**	**2,478**	**2,416**	**100%**	***-1.6%***
Chg %	*-4.8%*	*2.2%*	*-2.5%*	*-0.3%*	*-2.5%*		
US$/oz	410	445	604	697	872		

Global gold fabrication demand (tonnes)							
					Top 5 =	53%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
India	618	695	633	684	578	20%	*1.4%*
China	236	258	270	327	342	12%	*10.2%*
Turkey	285	303	242	277	237	8%	*-1.9%*
Italy	315	284	227	218	180	6%	*-11.6%*
US	224	219	211	180	176	6%	*-4.8%*
Japan	159	164	175	178	164	6%	*1.6%*
Saudi Arabia	118	125	90	100	87	3%	*-4.6%*
South Korea	82	83	82	86	78	3%	*-1.7%*
Russia	55	61	65	79	76	3%	*8.7%*
Indonesia	91	87	65	63	61	2%	*-6.5%*
Others	988	1,013	875	884	871	31%	*-1.6%*
Global	**3,172**	**3,291**	**2,936**	**3,076**	**2,850**	**100%**	***-1.0%***
Chg %	*5.8%*	*3.8%*	*-10.8%*	*4.8%*	*-7.3%*		
US$/oz	410	445	604	697	872		

Source: GFMS, Gold Survey 2009

Top 10 silver producers and consumers ranked by 2008 market share

Global silver mine (tonnes)							
					Top 5 =	61%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
Peru	3,060	3,191	3,456	3,502	3,680	17%	*4.7%*
Mexico	2,569	2,896	2,970	3,135	3,241	15%	*4.8%*
China	1,967	2,084	2,342	2,451	2,575	12%	*7.1%*
Chile	1,360	1,378	1,602	1,928	1,397	7%	*1.3%*
Australia	2,222	2,407	1,729	1,879	1,925	9%	*0.6%*
Poland	1,362	1,260	1,260	1,232	1,210	6%	*-2.5%*
Russia	1,233	1,011	974	911	1,123	5%	*1.0%*
US	1,250	1,219	1,141	1,260	1,120	5%	*-2.0%*
Canada	1,295	1,064	970	830	669	3%	*-12.1%*
Kazakh-stan	703	812	796	706	628	3%	*-4.8%*
Others	2,298	2,494	2,706	2,824	3,611	17%	*8.3%*
Global total	**19,319**	**19,816**	**19,947**	**20,659**	**21,178**	**100%**	***2.5%***
Chg %	*3.4%*	*2.6%*	*0.7%*	*3.6%*	*2.5%*		
US$/oz	6.66	7.31	11.55	13.38	14.99		

Global silver fabrication demand (tonnes)							
					Top 5 =	63%	5 yrs
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**% pa**
US	5,608	5,891	5,778	5,604	5,807	22%	*1.3%*
Japan	3,826	3,860	4,097	4,155	4,151	16%	*2.8%*
India	2,163	2,850	2,575	2,770	2,868	11%	*-2.8%*
China	1,835	1,917	2,166	2,358	2,351	9%	*7.5%*
Germany	1,257	1,260	1,275	1,249	1,264	5%	*0.8%*
Italy	1,722	1,577	1,442	1,358	1,198	5%	*-7.1%*
CIS	879	926	963	1,048	1,082	4%	*5.4%*
Thailand	1,151	1,150	1,150	1,140	1,041	4%	*-1.8%*
Belgium	858	814	894	850	792	3%	*-2.7%*
UK/ Ireland	1,604	1,330	1,013	780	729	3%	*-11.6%*
Others	4,927	4,773	4,592	4,824	4,613	18%	*-1.5%*
Global total	**25,830**	**26,348**	**25,945**	**26,136**	**25,896**	**100%**	***-0.2%***
Chg %	*-1.3%*	*2.0%*	*-1.5%*	*0.7%*	*-0.9%*		
US$/oz	6.66	7.31	11.55	13.38	14.99		

Source: Silver Institute (GFMS) World Silver Survey 2009

Precious metals – five-year historical view of top producers and consumers

Top platinum producers and consumers ranked by 2008 market share

Global platinum production (000 oz)								Global platinum consumption (000 oz)							
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5yrs % pa**	**Country**	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5yrs % pa**
S Africa	4,961	5,054	5,447	5,074	4,671	76%	*-0.1%*	**Europe**	2,226	2,432	2,566	2,608	2,493	32%	*4.6%*
Russia	840	960	948	917	835	14%	*0.0%*	**China**	1,743	1,677	1,512	1,255	1,341	17%	*-2.6%*
N Am	374	358	366	328	342	6%	*4.0%*	**N Am**	1,472	1,440	1,381	1,391	1,253	16%	*-5.3%*
Others	238	252	263	264	303	5%	*7.1%*	**Others**	2,325	2,262	2,392	2,707	2,707	35%	*1.7%*
Global	**6,413**	**6,624**	**7,024**	**6,583**	**6,151**	**100%**	***0.4%***	**Global**	**7,766**	**7,811**	**7,851**	**7,961**	**7,794**	**100%**	***0.4%***
Chg %	*6.4%*	*3.3%*	*6.0%*	*-6.3%*	*-6.6%*			**Chg %**	*1.5%*	*0.6%*	*0.5%*	*1.4%*	*-2.1%*		
US$/oz	846	897	1,143	1,305	1,572			**US$/oz**	846	897	1,143	1,305	1,572		

Source: GFMS Platinum & Palladium Survey 2009

Top palladium producers and consumers ranked by 2008 market share

Global palladium production (000 oz)								Global palladium consumption (000 oz)							
Country	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5yrs % pa**	**Country**	**2004**	**2005**	**2006**	**2007**	**2008**	**% Mkt.**	**5yrs % pa**
Russia	2,841	3,133	3,164	3,049	2,712	43%	-0.1%	**N Am**	2,204	2,331	2,350	2,421	2,180	26%	-1.2%
S Africa	2,468	2,591	2,857	2,678	2,366	37%	0.6%	**Japan**	1,688	1,608	1,785	1,853	1,866	22%	2.6%
N Am	1,039	930	1,024	983	908	14%	0.4%	**Europe**	1,662	1,597	1,676	1,792	1,804	21%	1.2%
Others	282	300	310	340	395	6%	9.3%	**Others**	1,759	2,228	2,349	2,471	2,549	30%	19.1%
Global	**6,630**	**6,954**	**7,355**	**7,050**	**6,381**	**100%**	**0.7%**	**Global**	**7,313**	**7,764**	**8,160**	**8,537**	**8,399**	**100%**	**4.6%**
Chg %	7.4%	4.9%	5.8%	-4.1%	-9.5%			**Chg %**	8.9%	6.2%	5.1%	4.6%	-1.6%		
US$/oz	230	201	320	355	351			**US$/oz**	230	201	320	355	351		

Source: GFMS Platinum & Palladium Survey 2009

Global Uranium Mine Production

Top Uranium producers ranked by 2008 market share

(tonnes)	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**%Mkt**	**5yrs %pa**
Canada	12,501	11,607	10,458	11,597	11,628	9,862	9,098	8,702	20%	*-3.6%*
Kazakhstan	2,115	2,727	2,952	3,719	4,346	5,279	6,638	8,521	20%	*23.6%*
Australia	7,720	7,211	7,603	9,007	9,559	7,606	8,603	8,471	20%	*2.2%*
Russia	2,500	2,900	3,073	3,280	3,325	3,200	3,413	3,521	8%	*2.8%*
Namibia	2,239	2,333	2,036	3,038	3,147	3,067	2,583	3,499	8%	*11.4%*
Niger	2,919	3,100	3,143	3,282	2,931	3,434	3,154	3,032	7%	*-0.7%*
Uzbekistan	1,962	1,860	1,770	2,016	2,020	2,260	2,320	2,300	5%	*5.4%*
USA	1,015	902	769	878	1,034	1,579	1,744	1,509	4%	*14.4%*
Ukraine	750	800	800	800	800	800	800	800	2%	*0.0%*
China	655	730	750	760	760	760	750	750	2%	*0.0%*
Others	1,970	2,197	1,905	2,023	1,937	1,480	1,625	1,581	4%	*-3.7%*
Global Total	**36,346**	**36,367**	**35,259**	**40,400**	**41,487**	**39,327**	**40,728**	**42,686**	**100%**	***3.9%***
YoY Change %	*4.5%*	*0.1%*	*-3.0%*	*14.6%*	*2.7%*	*-5.2%*	*3.6%*	*4.8%*		

Source: Monthly Bulletin of the World Bureau of Metal Statistics – Yearbook 2009

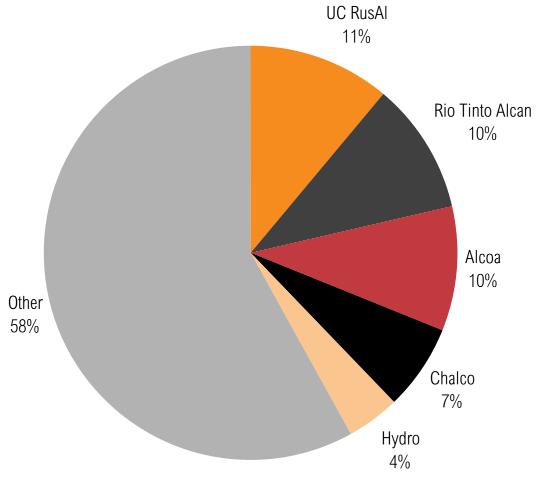
Top 10 metal-producing companies

Top 10 aluminium production companies ranked by 2008 global market share

Rank	Company	000t	Market Share	Cumulative share
1	UC RusAl	4,478	11%	11%
2	Rio Tinto Alcan	4,056	10%	21%
3	Alcoa	3,994	10%	31%
4	Chalco	2,643	7%	38%
5	Hydro	1,684	4%	42%
6	BHP Billiton	1,242	3%	45%
7	Dubal	899	2%	47%
8	Aluminium Bahrain	866	2%	49%
9	Century	800	2%	51%
10	China Power	747	2%	53%
	Other	18,741	47%	100%
	World smelter production	**40,150**	**100%**	

Source: CRU

Top five aluminium-producing companies ranked by 2008 global market share



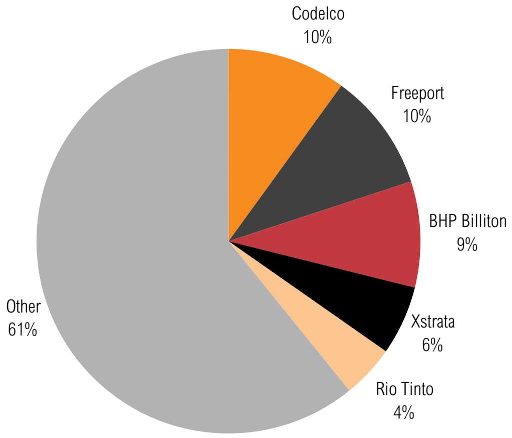
Source: CRU

Top 10 copper mine production companies ranked by 2008 global market share

Rank	Company	000t	Market Share	Cumulative share
1	Codelco	1,570	10%	10%
2	Freeport	1,549	10%	20%
3	BHP Billiton	1,360	9%	29%
4	Xstrata	915	6%	35%
5	Rio Tinto	689	4%	39%
6	Anglo American	664	4%	43%
7	SCC	457	3%	46%
8	Norilsk	437	3%	49%
9	KGHM	429	3%	52%
10	Kazakhmys	364	2%	54%
	Other	7,114	46%	100%
	World mine production	**15,548**	**100%**	

Source: CRU

Top five copper mine production companies ranked by 2008 global market share



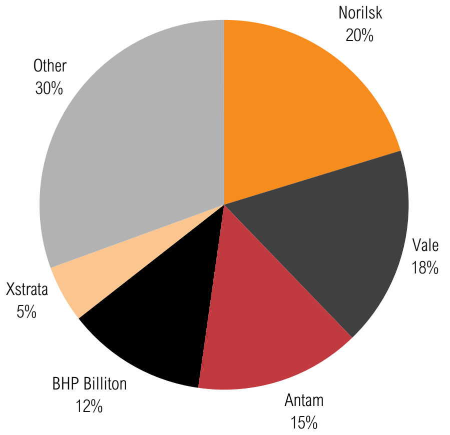
Source: CRU

Top 10 nickel mine production companies ranked by 2008 global market share

Rank	Company	000t	Market Share	Cumulative share
1	Norilsk	294	20%	20%
2	Vale	254	18%	38%
3	Antam	211	15%	52%
4	BHP Billiton	177	12%	64%
5	Xstrata	75	5%	70%
6	Cubaniquel	59	4%	74%
7	JNMC	59	4%	78%
8	Eramet	53	4%	81%
9	SMSP	34	2%	84%
10	Minara	32	2%	86%
	Other	204	14%	100%
	World mine production	1,452	100%	

Source: CRU

Top five nickel mine production companies ranked by 2008 global market share



Source: CRU

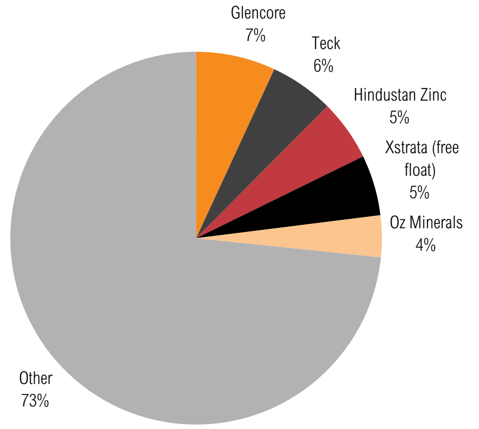
Top 10 metal-producing companies

Top 10 zinc mine production companies ranked by 2008 global market share

Rank	Company	000t	Market Share	Cumulative share
1	Glencore	794	7%	7%
2	Teck	663	6%	13%
3	Hindustan Zinc	615	5%	18%
4	Xstrata (free float)	586	5%	23%
5	Oz Minerals	423	4%	27%
6	Volcan	353	3%	30%
7	Anglo American	339	3%	33%
8	Zinifex	298	3%	35%
9	Boliden	297	3%	38%
10	Votorantim	215	2%	40%
	Other	7,003	60%	100%
	World mine production	**11,586**	**100%**	

Source: CRU

Top five zinc mine production companies ranked by 2008 global market share



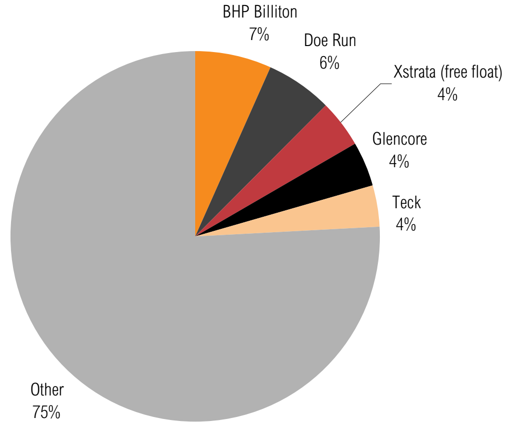
Source: CRU

Top 10 lead mine production companies ranked by 2008 global market share

Rank	Company	000t	Market Share	Cumulative share
1	BHP Billiton	257	7%	7%
2	Doe Run	225	6%	13%
3	Xstrata (free float)	152	4%	17%
4	Glencore	151	4%	20%
5	Teck	137	4%	24%
6	Volcan	106	3%	27%
7	Hindustan Zinc	79	2%	29%
8	Apex Silver	70	2%	31%
9	Oz Minerals	63	2%	32%
10	Anglo American	55	1%	34%
	Other	2,540	66%	100%
	World mine production	**3,835**	**100%**	

Source: CRU

Top five lead mine production companies ranked by 2008 global market share



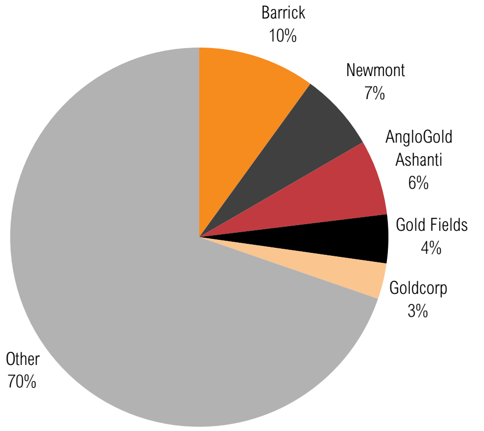
Source: CRU

Top 10 gold mine production companies ranked by 2008 global market share

Rank	Company	tonnes	Market Share	Cumulative share
1	Barrick	238	10%	10%
2	Newmont	162	7%	17%
3	AngloGold Ashanti	155	6%	23%
4	Gold Fields	104	4%	27%
5	Goldcorp	72	3%	30%
6	Navoi MMC	61	3%	33%
7	Newcrest	55	2%	35%
8	Kinross	52	2%	37%
9	Harmony	51	2%	39%
10	Polyus	38	2%	41%
	Other	1,426	59%	100%
	World mine production	**2,414**	**100%**	

Source: GFMS

Top five gold mine production companies ranked by 2008 global market share



Source: GFMS

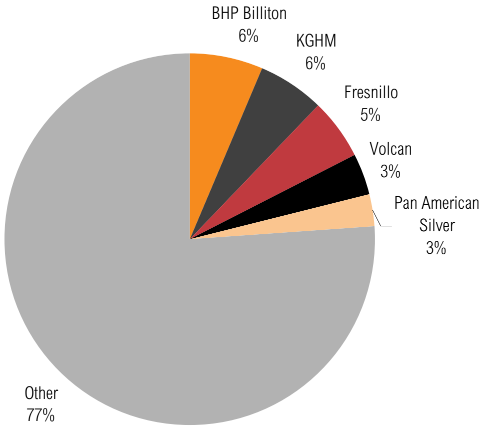
Top 10 metal-producing companies

Top 10 silver mine production companies ranked by 2008 global market share

Rank	Company	tonnes	Market Share	Cumulative share
1	BHP Billiton	1,360	6%	6%
2	KGHM	1,235	6%	12%
3	Fresnillo	1,119	5%	18%
4	Volcan	739	3%	21%
5	Pan American Silver	601	3%	24%
6	Buenaventura	563	3%	27%
7	Polymetal	553	3%	29%
8	Hochschild	543	3%	32%
9	Kazakhmys	502	2%	34%
10	Southern Copper	395	2%	36%
	Other	13,569	64%	100%
	World mine production	**21,179**	**100%**	

Source: GFMS

Top five silver mine production companies ranked by 2008 global market share



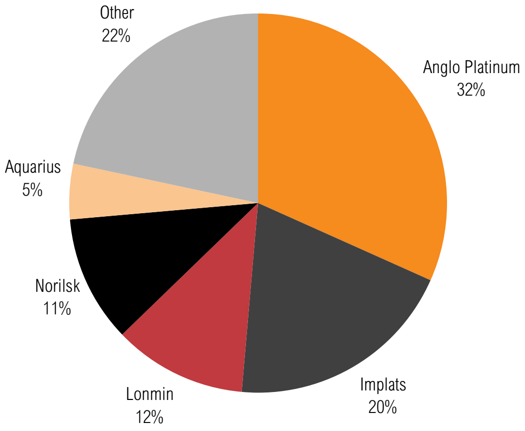
Source: GFMS

Top 10 platinum mine production companies ranked by 2008 global market share

Rank	Company	000 oz	Market Share	Cumulative share
1	Anglo Platinum	1,947	32%	32%
2	Implats	1,214	20%	51%
3	Lonmin	708	12%	63%
4	Norilsk	659	11%	74%
5	Aquarius	283	5%	78%
6	Northam	175	3%	81%
7	Vale Inco	166	3%	84%
8	Xstrata	164	3%	86%
9	Artel Amur	122	2%	88%
10	Stillwater	115	2%	90%
	Other	598	10%	100%
	World mine production	**6,151**	**100%**	

Source: GFMS

Top five platinum mine production companies ranked by 2008 global market share



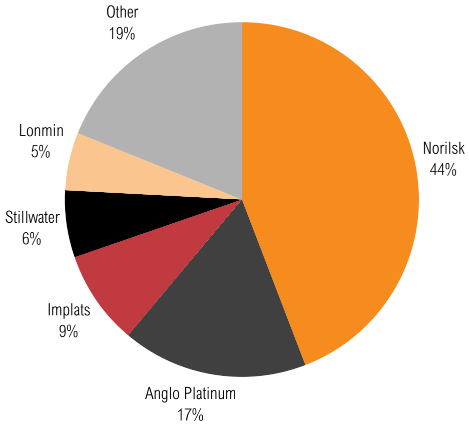
Source: GFMS

Top 10 palladium mine production companies ranked by 2008 global market share

Rank	Company	000 oz	Market Share	Cumulative share
1	Norilsk	2,821	44%	44%
2	Anglo Platinum	1,071	17%	61%
3	Implats	560	9%	70%
4	Stillwater	384	6%	76%
5	Lonmin	331	5%	81%
6	Vale Inco	231	4%	85%
7	N. American Palladium	212	3%	88%
8	Aquarius	148	2%	90%
9	Xstrata	123	2%	92%
10	ARM Platinum	101	2%	94%
	Other	399	6%	100%
	World mine production	**6,381**	**100%**	

Source: GFMS

Top five palladium mine production companies ranked by 2008 global market share



Source: GFMS

Global refined base metals production

30-year annual global refined base metals production (000 tonnes)

Year	IMF World GDP yoy %	yoy Change %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1978	4.6	0.2	14,776	9,232	5,497	6,038	622	236
1979	3.8	-0.8	15,175	9,367	5,659	6,456	673	244
1980	2.0	-1.8	16,035	9,268	5,454	6,133	742	245
1981	2.2	0.2	15,698	9,577	5,346	6,127	704	244
1982	0.9	-1.3	13,990	9,440	5,247	5,855	630	208
1983	2.8	1.9	14,334	9,694	5,235	6,124	680	227
1984	4.6	1.8	15,941	9,512	5,336	6,377	747	225
1985	3.6	-1.0	15,555	9,689	5,411	6,480	775	217
1986	3.5	-0.1	15,619	9,862	5,273	6,390	767	209
1987	3.7	0.2	16,483	10,160	5,470	6,627	806	207
1988	4.5	0.8	18,575	10,485	5,644	6,856	851	227
1989	3.7	-0.8	19,135	10,858	5,705	6,784	857	243
1990	2.9	-0.8	19,348	10,809	5,473	6,746	858	248
1991	1.5	-1.5	19,653	10,688	5,383	6,895	842	223
1992	2.0	0.6	19,459	11,170	5,484	7,035	872	206
1993	2.0	0.0	19,715	11,306	5,479	7,182	797	217
1994	3.4	1.4	19,112	11,166	5,455	7,123	832	222
1995	3.3	-0.1	19,658	11,829	5,761	7,362	916	216
1996	3.7	0.5	20,846	12,756	5,838	7,464	958	228
1997	4.0	0.3	21,798	13,605	6,029	7,802	1,014	238
1998	2.5	-1.5	22,654	14,120	6,020	8,042	1,042	241
1999	3.5	1.0	23,707	14,465	6,289	8,395	1,037	247
2000	4.7	1.2	24,418	14,816	6,665	9,021	1,109	264
2001	2.2	-2.5	24,436	15,675	6,585	9,272	1,157	270
2002	2.8	0.6	26,076	15,350	6,670	9,754	1,187	266
2003	3.6	0.8	28,001	15,273	6,787	9,912	1,211	276
2004	4.9	1.3	29,936	15,928	6,998	10,392	1,251	343
2005	4.5	-0.5	32,017	16,573	7,640	10,222	1,288	350
2006	5.1	0.6	33,975	17,295	7,937	10,655	1,336	351
2007	5.0	-0.1	38,108	17,944	8,132	11,366	1,445	349
2008	3.9	-1.1	39,265	18,245	8,679	11,702	1,351	332

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Compound annual growth rate of global refined base metal production over varying periods

	Av IMF World GDP yoy %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-90	3.2	1.9%	1.6%	0.0%	1.0%	1.5%	0.1%
1990-2000	2.9	2.4%	3.2%	2.0%	2.9%	2.6%	0.6%
2000-08	4.1	6.1%	2.6%	3.4%	3.3%	2.5%	2.9%
1978-2008	3.4	3.3%	2.3%	1.5%	2.2%	2.6%	1.1%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Annual changes in global refined base metals production

30-year annual percentage changes in global refined base metal production

Year	IMF World GDP yoy %	yoy Change %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1979	3.8	-0.8	2.7%	1.5%	2.9%	6.9%	8.2%	3.5%
1980	2.0	-1.8	5.7%	-1.1%	-3.6%	-5.0%	10.3%	0.3%
1981	2.2	0.2	-2.1%	3.3%	-2.0%	-0.1%	-5.1%	-0.4%
1982	0.9	-1.3	-10.9%	-1.4%	-1.9%	-4.4%	-10.5%	-14.8%
1983	2.8	1.9	2.5%	2.7%	-0.2%	4.6%	7.9%	8.9%
1984	4.6	1.8	11.2%	-1.9%	1.9%	4.1%	9.9%	-0.6%
1985	3.6	-1.0	-2.4%	1.9%	1.4%	1.6%	3.7%	-3.5%
1986	3.5	-0.1	0.4%	1.8%	-2.6%	-1.4%	-1.0%	-3.8%
1987	3.7	0.2	5.5%	3.0%	3.7%	3.7%	5.0%	-1.1%
1988	4.5	0.8	12.7%	3.2%	3.2%	3.5%	5.6%	9.9%
1989	3.7	-0.8	3.0%	3.6%	1.1%	-2.1%	0.7%	6.7%
1990	2.9	-0.8	1.1%	-0.5%	-4.1%	-1.4%	0.1%	2.1%
1991	1.5	-1.5	1.6%	-1.1%	-1.6%	0.3%	-1.8%	-10.1%
1992	2.0	0.6	-1.0%	4.5%	1.9%	-0.7%	3.6%	-7.3%
1993	2.0	0.0	1.3%	1.2%	-0.1%	0.2%	-8.6%	4.9%
1994	3.4	1.4	-3.1%	-1.2%	-0.4%	5.3%	4.4%	2.3%
1995	3.3	-0.1	2.9%	5.9%	5.6%	8.0%	10.2%	-2.4%
1996	3.7	0.5	6.0%	7.8%	1.3%	0.4%	4.6%	5.3%
1997	4.0	0.3	4.6%	6.7%	3.3%	3.6%	5.8%	4.6%
1998	2.5	-1.5	3.9%	3.8%	-0.1%	2.6%	2.7%	1.3%
1999	3.5	1.0	4.6%	2.4%	4.5%	6.8%	-0.4%	2.2%
2000	4.7	1.2	3.0%	2.4%	6.0%	7.5%	6.9%	6.9%
2001	2.2	-2.5	0.1%	5.8%	-1.2%	2.8%	4.3%	2.5%
2002	2.8	0.6	6.7%	-2.1%	1.3%	5.0%	2.5%	-1.4%
2003	3.6	0.8	7.4%	-0.5%	1.8%	1.6%	2.1%	3.8%
2004	4.9	1.3	6.9%	4.3%	3.1%	4.8%	3.3%	24.1%
2005	4.5	-0.5	7.0%	4.0%	9.2%	-1.6%	2.9%	2.0%
2006	5.1	0.6	6.1%	4.4%	3.9%	4.2%	3.7%	0.3%
2007	5.0	-0.1	12.2%	3.8%	2.5%	6.7%	8.2%	-0.6%
2008	4.1	-0.9	3.0%	1.7%	6.7%	3.0%	-6.5%	-4.9%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Percentage changes in average annual global refined base metals production over varying periods

	Av IMF World GDP yoy %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-90	3.2	20.7%	16.6%	0.3%	10.0%	15.5%	1.2%
1990-2000	2.9	26.2%	37.1%	21.8%	33.7%	29.4%	6.4%
2000-08	4.1	60.8%	23.1%	30.2%	29.7%	21.8%	25.9%
1978-2007	3.4	165.7%	97.6%	57.9%	93.8%	117.3%	40.7%

Source: IMF, World Bureau of Metal Statistics ILZSG, ICSG

Global refined base metals consumption

30-year annual global refined base metals consumption (000 tonnes)

Year	IMF World GDP yoy %	yoy Change %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1978	4.6	0.2	15,329	9,530	5,583	6,328	697	232
1979	3.8	-0.8	15,981	9,830	5,646	6,437	750	237
1980	2.0	-1.8	15,298	9,375	5,429	6,242	717	224
1981	2.2	0.2	14,516	9,525	5,345	6,116	662	213
1982	0.9	-1.3	14,161	9,019	5,179	5,902	650	199
1983	2.8	1.9	15,361	9,099	5,189	6,181	689	208
1984	4.6	1.8	15,574	9,914	5,312	6,350	780	221
1985	3.6	-1.0	15,862	9,665	5,315	6,347	788	215
1986	3.5	-0.1	16,071	10,070	5,380	6,547	776	223
1987	3.7	0.2	17,053	10,449	5,464	6,722	838	229
1988	4.5	0.8	18,867	10,531	5,527	6,848	857	233
1989	3.7	-0.8	19,244	10,969	5,562	6,715	848	232
1990	2.9	-0.8	19,226	10,780	5,403	6,620	842	239
1991	1.5	-1.5	18,743	10,695	5,328	6,642	799	209
1992	2.0	0.6	18,558	10,801	5,290	6,597	799	224
1993	2.0	0.0	18,166	10,972	5,203	6,609	824	239
1994	3.4	1.4	19,762	11,639	5,489	6,960	910	241
1995	3.3	-0.1	20,555	12,150	5,802	7,519	998	240
1996	3.7	0.5	20,684	12,399	5,975	7,551	904	239
1997	4.0	0.3	21,870	13,017	6,053	7,822	990	245
1998	2.5	-1.5	21,889	13,353	6,065	8,033	992	243
1999	3.5	1.0	23,356	14,057	6,242	8,575	1,057	250
2000	4.7	1.2	25,059	15,192	6,515	9,007	1,172	278
2001	2.2	-2.5	23,722	14,686	6,480	8,928	1,138	282
2002	2.8	0.6	25,372	15,051	6,635	9,385	1,186	276
2003	3.6	0.8	27,606	15,716	6,844	9,839	1,249	302
2004	4.9	1.3	29,965	16,840	7,296	10,647	1,251	334
2005	4.5	-0.5	31,689	16,673	7,803	10,611	1,296	345
2006	5.1	0.6	33,954	17,042	8,075	10,972	1,366	363
2007	5.0	-0.1	37,561	18,175	8,189	11,309	1,353	356
2008	3.9	-1.1	37,020	18,007	8,649	11,481	1,297	337

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Compound annual growth rate of global refined base metal consumption over varying periods

	Av IMF World GDP yoy %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-90	3.2	2.3%	1.4%	0.0%	0.6%	1.6%	0.6%
1990-2000	3.1	2.7%	3.5%	1.9%	3.1%	3.4%	1.5%
2000-08	4.1	5.0%	2.1%	3.6%	3.1%	1.3%	2.4%
1978-2008	3.4	3.0%	2.1%	1.5%	2.0%	2.1%	1.3%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Annual changes in global refined base metals consumption

30-year annual percentage changes in global refined base metals consumption

Year	IMF World GDP yoy %	yoy Change %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1979	3.8	-0.8	4.3%	3.1%	1.1%	1.7%	7.6%	2.3%
1980	2.0	-1.8	-4.3%	-4.6%	-3.8%	-3.0%	-4.5%	-5.4%
1981	2.2	0.2	-5.1%	1.6%	-1.5%	-2.0%	-7.6%	-4.9%
1982	0.9	-1.3	-2.4%	-5.3%	-3.1%	-3.5%	-1.9%	-6.6%
1983	2.8	1.9	8.5%	0.9%	0.2%	4.7%	6.0%	4.2%
1984	4.6	1.8	1.4%	9.0%	2.4%	2.7%	13.3%	6.6%
1985	3.6	-1.0	1.8%	-2.5%	0.1%	0.0%	1.0%	-2.9%
1986	3.5	-0.1	1.3%	4.2%	1.2%	3.2%	-1.6%	3.8%
1987	3.7	0.2	6.1%	3.8%	1.6%	2.7%	8.0%	2.9%
1988	4.5	0.8	10.6%	0.8%	1.2%	1.9%	2.3%	1.5%
1989	3.7	-0.8	2.0%	4.2%	0.6%	-1.9%	-1.1%	-0.3%
1990	2.9	-0.8	-0.1%	-1.7%	-2.9%	-1.4%	-0.6%	2.9%
1991	1.5	-1.5	-2.5%	-0.8%	-1.4%	0.3%	-5.2%	-12.6%
1992	2.0	0.6	-1.0%	1.0%	-0.7%	-0.7%	0.1%	7.4%
1993	2.0	0.0	-2.1%	1.6%	-1.6%	0.2%	3.1%	6.6%
1994	3.4	1.4	8.8%	6.1%	5.5%	5.3%	10.4%	0.7%
1995	3.3	-0.1	4.0%	4.4%	5.7%	8.0%	9.7%	-0.2%
1996	3.7	0.5	0.6%	2.0%	3.0%	0.4%	-9.4%	-0.5%
1997	4.0	0.3	5.7%	5.0%	1.3%	3.6%	9.6%	2.4%
1998	2.5	-1.5	0.1%	2.6%	0.2%	2.6%	0.2%	-0.8%
1999	3.5	1.0	6.7%	5.3%	2.9%	6.8%	6.5%	3.1%
2000	4.7	1.2	7.3%	8.1%	4.4%	5.0%	10.9%	11.3%
2001	2.2	-2.5	-5.3%	-3.3%	-0.5%	-0.9%	-2.9%	1.5%
2002	2.8	0.6	7.0%	2.5%	2.4%	5.1%	4.3%	-2.4%
2003	3.6	0.8	8.8%	4.4%	3.1%	4.8%	5.3%	9.5%
2004	4.9	1.3	8.5%	7.2%	6.6%	8.2%	0.2%	10.7%
2005	4.5	-0.5	5.8%	-1.0%	6.9%	-0.3%	3.6%	3.3%
2006	5.1	0.6	7.1%	2.2%	3.5%	3.4%	5.4%	5.2%
2007	5.0	-0.1	10.6%	6.6%	1.4%	3.1%	-1.0%	-1.9%
2008	3.9	-1.1	-1.4%	-0.9%	5.6%	1.5%	-4.1%	-5.3%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Percentage changes in average annual global refined base metals consumption over varying periods

	Av IMF World GDP yoy %	Aluminium	Copper	Lead	Zinc	Nickel	Tin
1980-90	3.2	25.7%	15.0%	-0.5%	6.1%	17.5%	6.6%
1990-2000	3.1	30.3%	40.9%	20.6%	36.1%	39.2%	16.6%
2000-08	4.1	47.7%	18.5%	32.8%	27.5%	10.7%	21.1%
1978-2008	3.4	141.5%	88.9%	54.9%	81.4%	86.0%	45.6%

Source: IMF, World Bureau of Metal Statistics, ILZSG, ICSG

Summary of global precious metals mine production and consumption

Global precious metals mine production (2000-08)

	Precious metals mine production (tonnes)				Percentage change in precious metals mine production			
Year	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
2000	2,618	18,381	156	165	0.63%	6.12%	-3.16%	1.79%
2001	2,645	18,856	168	173	1.01%	2.58%	7.18%	4.93%
2002	2,618	18,472	180	185	-1.02%	-2.04%	7.40%	7.24%
2003	2,621	18,557	187	192	0.11%	0.46%	4.11%	3.70%
2004	2,494	19,068	199	206	-4.84%	2.75%	6.42%	7.42%
2005	2,550	19,817	206	216	2.25%	3.93%	3.29%	4.89%
2006	2,485	19,947	218	229	-2.55%	0.66%	6.04%	5.77%
2007	2,478	20,659	205	219	-0.28%	3.57%	-6.28%	-4.15%
2008	2,416	21,178	191	198	-2.50%	2.51%	-6.56%	-9.49%
Chg, 2000-08	*-202*	*2,797*	*35*	*34*	*-8%*	*15%*	*22%*	*21%*

Source: GFMS – Gold Survey 2009, Platinum & Palladium Survey 2009, Silver Institute (GFMS) World Silver Survey 2009

Global precious metals fabrication (2000-08)

	Precious metals fabrication (tonnes)				Percentage change in precious metals fabrication			
Year	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
2000	3,761	27,734	197	287	0.79%	3.16%	0.59%	-2.91%
2001	3,482	26,721	216	220	-7.43%	-3.65%	9.64%	-23.47%
2002	3,141	25,733	234	205	-9.79%	-3.70%	8.36%	-6.85%
2003	2,997	26,169	238	209	-4.59%	1.69%	1.77%	2.07%
2004	3,172	25,830	242	227	5.85%	-1.30%	1.52%	8.86%
2005	3,291	26,348	243	241	3.75%	2.01%	0.58%	6.17%
2006	2,936	25,945	244	254	-10.79%	-1.53%	0.51%	5.10%
2007	3,076	26,136	248	266	4.77%	0.74%	1.40%	4.62%
2008	2,850	25,896	242	261	-7.35%	-0.92%	-2.10%	-1.62%
Chg, 2000-08	*3,761*	*27,734*	*197*	*287*	*0.79%*	*3.16%*	*0.59%*	*-2.91%*

Source: Gold Survey 2009, Platinum & Palladium Survey 2009, Silver Institute (GFMS) World Silver Survey 2009

Weights-conversion table

Imperial	**Factor**	**Metric**	**Metric**	**Factor**	**Imperial**
Troy ounces	X 31.1034	Grams	Grams	X 0.0321508	Troy ounces
Pounds – lbs	X 0.453592	Kilograms	Kilograms	X 2.2046	Pounds – lbs
Short tons	X 0.90718	Tonnes	Tonnes	X 1.102317	Short tons
Troy ounces/short tons	X 34.286	Grams per tonne	Grams per tonne	X 0.029167	Troy ounces/short tons
USc/lb	X 22.046	US$/tonne	US$/tonne	/ 22.046	USc/lb

Source: RBS

World's top 50 central bank gold holdings (value with gold at US$1,000/oz)

Rank	Country	Gold reserves tonnes	Gold reserves moz	% of world gold reserves	Value US$bn	Gold's % of total forex reserves
1	United States	8,133.5	261.5	27.4%	261.5	77.4%
2	Germany	3,408.3	109.6	11.5%	109.6	69.2%
3	IMF	3,217.3	103.4	10.9%	103.4	n.a.
4	Italy	2,451.8	78.8	8.3%	78.8	66.6%
5	France	2,445.1	78.6	8.3%	78.6	70.6%
6	China	1,054.0	33.9	3.6%	33.9	1.9%
7	Switzerland	1,040.1	33.4	3.5%	33.4	29.1%
8	Japan	765.2	24.6	2.6%	24.6	2.3%
9	Netherlands	612.5	19.7	2.1%	19.7	59.6%
10	Russia	568.4	18.3	1.9%	18.3	4.3%
11	ECB	501.4	16.1	1.7%	16.1	18.8%
12	Taiwan	423.6	13.6	1.4%	13.6	3.9%
13	Portugal	382.5	12.3	1.3%	12.3	90.9%
14	India	357.7	11.5	1.2%	11.5	4.0%
15	Venezuela	356.4	11.5	1.2%	11.5	36.1%
16	United Kingdom	310.3	10.0	1.0%	10.0	17.6%
17	Lebanon	286.8	9.2	1.0%	9.2	26.5%
18	Spain	281.6	9.1	1.0%	9.1	38.9%
19	Austria	280.0	9.0	0.9%	9.0	57.9%
20	Belgium	227.5	7.3	0.8%	7.3	41.2%
21	Algeria	173.6	5.6	0.6%	5.6	3.5%
22	Philippines	157.9	5.1	0.5%	5.1	11.9%
23	Libya	143.8	4.6	0.5%	4.6	4.5%
24	Saudi Arabia	143.0	4.6	0.5%	4.6	12.3%
25	Sweden	131.0	4.2	0.4%	4.2	9.6%
26	Singapore	127.4	4.1	0.4%	4.1	2.2%
27	South Africa	124.8	4.0	0.4%	4.0	10.5%
28	BIS	120.0	3.9	0.4%	3.9	n.a.
29	Turkey	116.1	3.7	0.4%	3.7	5.0%
30	Greece	112.4	3.6	0.4%	3.6	90.2%
31	Romania	103.6	3.3	0.3%	3.3	7.5%
32	Poland	102.9	3.3	0.3%	3.3	4.6%
33	Thailand	84.0	2.7	0.3%	2.7	2.1%
34	Australia	79.9	2.6	0.3%	2.6	5.5%
35	Kuwait	79.0	2.5	0.3%	2.5	12.6%
36	Egypt	75.6	2.4	0.3%	2.4	7.2%
37	Indonesia	73.1	2.4	0.2%	2.4	3.9%
38	Kazakhstan	71.4	2.3	0.2%	2.3	10.8%
39	Denmark	66.5	2.1	0.2%	2.1	3.2%
40	Pakistan	65.4	2.1	0.2%	2.1	17.6%
41	Argentina	54.7	1.8	0.2%	1.8	3.6%
42	Finland	49.1	1.6	0.2%	1.6	15.6%
43	Bulgaria	39.9	1.3	0.1%	1.3	7.3%
44	WAEMU	36.5	1.2	0.1%	1.2	10.6%
45	Malaysia	36.4	1.2	0.1%	1.2	1.2%
46	Peru	34.7	1.1	0.1%	1.1	3.4%
47	Brazil	33.6	1.1	0.1%	1.1	0.5%
48	Slovakia	31.8	1.0	0.1%	1.02	85.6%
49	Bolivia	28.3	0.9	0.1%	0.9	10.7%
50	Ukraine	26.8	0.9	0.1%	0.9	2.7%
	World	**29,634**	**952.8**	**100%**	**952.8**	**n.a.**
	All countries	**26,297**	**845.5**	**88.7%**	**845.5**	**10.3%**
	CBGA (1) signatories	12,129	390.0	40.9%	390.0	49.4%
	CBGA (2) signatories	11,981	385.2	40.4%	385.2	52.0%

Source: World Gold Council, RBS

30-year average annual nominal spot base metals prices

Year	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1978	1,045	47.4	1,365	61.9	658	29.8	592	26.9	4,145	1.88	12,500	5.67
1979	1,532	69.5	1,984	90.0	1,202	54.5	742	33.7	5,600	2.54	14,815	6.72
1980	1,753	79.5	2,194	99.5	904	41.0	761	34.5	6,526	2.96	16,402	7.44
1981	1,268	57.5	1,746	79.2	728	33.0	861	39.1	6,063	2.75	14,021	6.36
1982	995	45.1	1,482	67.2	545	24.7	744	33.7	4,850	2.20	12,941	5.87
1983	1,437	65.2	1,592	72.2	425	19.3	767	34.8	4,674	2.12	13,007	5.90
1984	1,251	56.7	1,380	62.6	442	20.0	891	40.4	4,762	2.16	12,456	5.65
1985	1,041	47.2	1,413	64.1	390	17.7	799	36.2	4,916	2.23	11,464	5.20
1986	1,150	52.2	1,374	62.3	406	18.4	757	34.3	3,880	1.76	6,173	2.80
1987	1,565	71.0	1,781	80.8	596	27.0	799	36.2	4,872	2.21	6,724	3.05
1988	2,530	114.8	2,606	118.2	655	29.7	1,247	56.6	13,823	6.27	7,165	3.25
1989	1,951	88.5	2,859	129.7	672	30.5	1,656	75.1	13,338	6.05	8,598	3.90
1990	1,639	74.3	2,670	121.1	813	36.9	1,520	68.9	9,083	4.12	6,195	2.81
1991	1,302	59.1	2,337	106.0	557	25.3	1,116	50.6	8,157	3.70	5,556	2.52
1992	1,254	56.9	2,266	102.8	542	24.6	1,240	56.2	7,011	3.18	6,107	2.77
1993	1,139	51.7	1,913	86.8	406	18.4	961	43.6	5,291	2.40	5,159	2.34
1994	1,479	67.1	2,313	104.9	548	24.9	998	45.3	6,349	2.88	5,467	2.48
1995	1,805	81.9	2,937	133.2	631	28.6	1,031	46.8	8,223	3.73	6,217	2.82
1996	1,504	68.2	2,291	103.9	774	35.1	1,025	46.5	7,496	3.40	6,173	2.80
1997	1,598	72.5	2,278	103.3	624	28.3	1,318	59.8	6,922	3.14	6,164	2.80
1998	1,356	61.6	1,653	75.0	528	23.9	1,023	46.4	4,614	2.10	5,537	2.51
1999	1,362	61.8	1,573	71.4	502	22.8	1,077	48.9	6,023	2.73	5,398	2.45
2000	1,549	70.3	1,814	82.3	454	20.6	1,128	51.2	8,637	3.92	5,432	2.46
2001	1,444	65.5	1,577	71.6	476	21.6	886	40.2	5,945	2.70	4,480	2.03
2002	1,349	61.2	1,558	70.6	452	20.5	778	35.3	6,768	3.07	4,059	1.84
2003	1,431	64.9	1,780	80.7	515	23.4	828	37.6	9,636	4.37	4,893	2.22
2004	1,716	77.8	2,868	130.1	888	40.3	1,047	47.5	13,845	6.28	8,504	3.86
2005	1,897	86.0	3,683	167.1	975	44.2	1,381	62.7	14,727	6.69	7,365	3.34
2006	2,566	116.5	6,729	305.3	1,287	58.4	3,272	148.5	24,276	10.99	8,755	3.97
2007	2,638	119.7	7,125	323.3	2,594	117.7	3,249	147.4	37,167	16.89	14,526	6.59
2008	2,571	116.6	6,951	315.3	2,084	94.5	1,870	84.8	21,020	9.53	18,487	8.39

Source: LME, CRU, ILZSG

Average annual nominal spot base metals prices over varying periods

Period	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1980-89	1,494	67.8	1,843	83.6	576	26.1	928	42.1	6,770	3.07	10,895	4.94
1990-99	1,444	65.5	2,223	100.8	593	26.9	1,131	51.3	6,918	3.14	5,798	2.63
2000-08	1,907	86.5	3,787	171.8	1,081	49.0	1,604	72.8	15,780	7.16	8,500	3.86
1979-2008	1,602	72.7	2,558	116.0	754	34.2	1,192	54.1	9,483	4.30	8,608	3.90

Source: LME, CRU ILZSG

30-year average annual real spot base metals prices, (US CPI deflator 2008 = 1)

Year	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1978	2,736	124	3,573	162	1,723	78	1550	70	10,852	4.92	32,729	14.85
1979	3,705	168	4,798	218	2,906	132	1794	81	13,540	6.14	35,823	16.25
1980	3,884	176	4,862	221	2,004	91	1687	77	14,463	6.56	36,353	16.49
1981	2,570	117	3,538	160	1,475	67	1745	79	12,286	5.57	28,413	12.89
1982	1,900	86	2,829	128	1,041	47	1421	64	9,263	4.20	24,715	11.21
1983	2,640	120	2,924	133	781	35	1409	64	8,587	3.90	23,898	10.84
1984	2,215	100	2,444	111	783	36	1578	72	8,432	3.82	22,057	10.00
1985	1,789	81	2,429	110	670	30	1373	62	8,448	3.83	19,700	8.94
1986	1,933	88	2,309	105	683	31	1273	58	6,523	2.96	10,378	4.71
1987	2,562	116	2,916	132	976	44	1308	59	7,975	3.62	11,006	4.99
1988	4,004	182	4,124	187	1,037	47	1974	90	21,877	9.92	11,340	5.14
1989	2,975	135	4,361	198	1,025	46	2525	115	20,340	9.23	13,112	5.95
1990	2,406	109	3,920	178	1,194	54	2232	101	13,335	6.05	9,095	4.13
1991	1,847	84	3,315	150	790	36	1583	72	11,572	5.25	7,882	3.58
1992	1,739	79	3,143	143	752	34	1720	78	9,722	4.41	8,469	3.84
1993	1,544	70	2,593	118	550	25	1303	59	7,172	3.25	6,993	3.17
1994	1,963	89	3,070	139	727	33	1325	60	8,428	3.82	7,257	3.29
1995	2,348	106	3,821	173	821	37	1341	61	10,696	4.85	8,087	3.67
1996	1,920	87	2,924	133	988	45	1308	59	9,569	4.34	7,880	3.57
1997	2,007	91	2,860	130	784	36	1655	75	8,693	3.94	7,741	3.51
1998	1,684	76	2,053	93	656	30	1271	58	5,731	2.61	6,877	3.12
1999	1,667	76	1,926	87	615	28	1319	60	7,374	3.34	6,608	3.00
2000	1,856	84	2,174	99	544	25	1352	61	10,349	4.70	6,508	2.95
2001	1,690	77	1,846	84	557	25	1037	47	6,956	3.16	5,242	2.38
2002	1,551	70	1,791	81	520	24	895	41	7,783	3.53	4,668	2.12
2003	1,611	73	2,004	91	580	26	932	42	10,851	4.92	5,510	2.50
2004	1,878	85	3,139	142	972	44	1146	52	15,155	6.87	9,309	4.22
2005	2,011	91	3,904	177	1,033	47	1464	66	15,610	7.09	7,806	3.54
2006	2,635	120	6,911	314	1,322	60	3360	152	24,930	11.29	8,990	4.08
2007	2,638	120	7,125	323	2,594	118	3249	147	37,167	16.89	14,526	6.59
2008	2,571	117	6,951	315	2,084	95	1,870	85	21,020	9.53	18,487	8.39

Source: LME, CRU, ILZSG, IMF

Average annual real spot base metals prices over varying periods (US CPI deflator 2008 = 1)

Period	Aluminium		Copper		Lead		Zinc		Nickel		Tin	
	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	USc/lb	US$/ tonne	US$/lb	US$/ tonne	US$/lb
1980-89	2,647	120.1	3,274	148.5	1,047	47.5	1,629	73.9	11,819	5.36	20,097	9.12
1990-99	1,913	86.8	2,963	134.4	788	35.7	1,506	68.3	9,229	4.19	7,689	3.49
2000-08	2,049	93.0	3,983	180.7	1,134	51.5	1,701	77.2	16,647	7.55	9,005	4.08
1979-2008	2,258	102.4	3,433	155.7	1,049	47.6	1,615	73.3	12,462	5.65	13,158	5.97

Source: LME, CRU, ILZSG, IMF

30-year average annual nominal and real spot precious metals prices

	Nominal precious metals spot prices US$/oz				Real precious metals spot prices US$/oz (US CPI deflator 2008 = 1)			
Year	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
1978	194	5.42	260	63.0	507	14.2	680	165
1979	305	11.07	448	120	737	26.8	1,083	290
1980	615	20.98	662	201	1,362	46.5	1,467	445
1981	459	10.49	446	95	931	21.3	905	193
1982	375	7.92	328	67	717	15.1	627	128
1983	424	11.43	425	136	778	21.0	780	250
1984	361	8.15	357	148	639	14.4	633	262
1985	317	6.13	293	107	545	10.5	504	184
1986	368	5.47	467	116	618	9.2	785	195
1987	446	7.02	557	130	730	11.5	911	213
1988	437	6.53	530	123	691	10.3	839	195
1989	231	5.50	510	144	352	8.4	777	220
1990	384	4.83	472	114	563	7.1	693	167
1991	362	4.06	376	90	514	5.8	534	128
1992	344	3.95	360	85	477	5.5	499	118
1993	360	4.31	374	115	488	5.8	507	156
1994	384	5.29	405	136	510	7.0	538	181
1995	384	5.20	424	156	499	6.8	552	203
1996	388	5.20	397	128	495	6.6	507	163
1997	331	4.90	395	178	416	6.1	496	224
1998	294	5.53	372	284	365	6.87	462	353
1999	279	5.22	377	358	341	6.39	462	438
2000	279	4.95	545	683	334	5.93	653	818
2001	271	4.37	529	602	317	5.11	619	705
2002	310	4.60	540	337	356	5.29	621	388
2003	363	4.88	692	200	409	5.49	779	226
2004	409	6.66	846	230	448	7.29	926	252
2005	445	7.31	897	201	472	7.75	951	214
2006	604	11.55	1,142	320	620	11.86	1,173	329
2007	696	13.38	1,305	355	696	13.38	1,305	355
2008	872	14.99	1,572	351	872	14.99	1,572	351

Source: LBMA, LPPM, Johnson Matthey, GFMS

Average annual nominal and real spot precious metals prices over varying periods

	Nominal precious metals spot prices US$/oz				Real precious metals spot prices US$/oz (US CPI deflator 2008 = 1)			
Period	**Gold**	**Silver**	**Platinum**	**Palladium**	**Gold**	**Silver**	**Platinum**	**Palladium**
1980-89	403	8.96	458	127	736	16.82	823	228
1990-99	351	4.85	395	164	467	6.40	525	213
2000-08	472	8.08	896	364	503	8.57	955	404
1979-2008	403	7.39	568	210	576	11.20	772	278

Source: LBMA, LPPM, Johnson Matthey, GFMS

Selected glossary of useful mining industry websites

Resource company websites

Resource company	Key business area	Website address
Alcoa	Aluminium	www.alcoa.com
Alumina Limited	Alumina	www.aluminalimited.com
Anglo American	Diversified miner	www.angloamerican.co.uk
Anglo Platinum	Platinum	www.angloplatinum.com
Anglogold	Gold	www.anglogold.com
Antofagasta	Copper	www.antofagasta.co.uk
ArcelorMittal	Steel	www.arcelormittal.com
Arch Coal	Coal	www.archcoal.com
Ashanti	Gold	www.ashantigold.com
Baoshan Steel	Steel	www.baosteel.com
Barrick Gold	Gold	www.barrick.com
BHP Billiton	Diversified miner	www.bhpbilliton.com
Boliden AB	Diversified miner	www.boliden.com
Buenaventura	Diversified miner	www.buenaventura.com
Cameco Corp	Uranium	www.cameco.com
Centennial Coal	Coal	www.centennialcoal.com.au
Codelco	Copper	www.codelco.com
Consol	Coal	www.consolenergy.com
Cumerio	Copper	www.cumerio.com
Durban Deep	Gold	www.drd.co.za
Eramet	Nickel	www.eramet.fr
Freeport McMoRan Copper & Gold	Copper and gold	www.fcx.com
Fresnillo	Silver – gold	www.fresnilloplc.com
Gold Fields Ltd	Gold	www.goldfields.co.za
GoldCorp	Gold	www.goldcorp.com
Grupo Mexico	Copper	www.grupomexico.com
Harmony	Gold	www.harmonygold.com
Hindalco	Aluminium	www.hindalco.com
Iluka	Titanium	www.iluka.com
Impala Platinum	Platinum	www.implats.co.za
Ivernia West	Zinc	www.ivernia.com
Jiangxi Copper	Copper	www.jxcn.cn/english
Johnson Matthey	Precious metals	www.matthey.com
Kaiser Aluminium	Alumina and aluminium	www.kaiseral.com
KGHM	Copper	www.polishcopper.com
Kinross Gold	Gold	www.kinross.com
Korea Zinc	Zinc	www.koreazinc.co.kr
Kumba Resources	Diversified miner	www.kumbaresources.com
Lihir	Gold	www.lihir.com.pg
Lonmin	Platinum and gold	www.lonmin.com
Macarthur Coal	Coal	www.macarthurcoal.com.au
Meridian Gold	Gold	www.meridiangold.com
Minara Nickel	Nickel	www.minara.com.au
Nalco	Aluminium	www.nalco.com
Newcrest	Gold	www.newcrest.com.au
Newmont	Gold	www.newmont.com
Nippon Steel Corp	Steel	www.nsc.co.jp
Norilsk Nickel	Nickel, copper and PGM	www.nornik.ru
Northam	Platinum	www.northam.co.za
Nucor	Steel	www.nucor.com
Outokumpu	Stainless steel	www.outokumpu.com
OZ Minerals	Zinc, copper, gold	www.ozminerals.com

Peabody	Coal	www.peabodyenergy.com
Penoles	Lead-zinc miner	www.penoles.com.mx
Peter Hambro Mining	Gold	www.peterhambro.com
Posco	Steel	www.posco.co.kr
Rio Tinto	Diversified miner	www.riotinto.com
Rusal	Aluminium	www.rusal.com
Sterlite	Copper	www.sterlite.com
Stillwater	Platinum	www.stillwatermining.com
Teck	Lead-zinc	www.teck.com
ThyssenKrupp	Steel	www.thyssenkrupp.com
Umicore	Zinc, copper, diamonds	www.umicore.com
Vale	Diversified miner	www.vale.com
Vedanta Resources	Copper, aluminium and zinc	www.vedantaresources.com
Xstrata	Ferrochrome, vandium, coal	www.xstrata.com

Source: Company data, RBS

Websites with useful industry statistics

Basemetals.com	Newswire	www.basemetals.com
China Daily	Newswire	www.chinadaily.com.cn
China.org.cn	China customs and other data	www.china.org.cn
Cobalt News	Cobalt institute	www.cobaltdevinstitute.com
Copper Development Association (UK)	Copper research and statistics	www.copperinfo.co.uk
Copper Development Association (US)	Copper research and statistics	www.copper.org
GFMS	Precious and base metals research	www.gfms.co.uk
Gold Institute	Gold	www.goldinstitute.net
IAI	Aluminium statistics	www.world-aluminium.org
International Copper Study Group	Copper statistics	www.icsg.org
International Lead-Zinc Study Group	Lead and zinc statistics	www.ilzsg.org
International Nickel Study Group	Nickel industry statistics	www.insg.org
International Wrought Copper Council	Copper research and statistics	www.coppercouncil.org
ITRI	Tin research and statistics	www.itri.co.uk
Johnson Matthey	Platinum industry statistics	www.platinum.matthey.com
London Bullion Market Association	Gold and silver price fixes	www.lbma.org.uk
London Metal Exchange	Metals trading	www.lme.co.uk
Metal Bulletin	Mining Industry magazine	www.metalbulletin.com
Mining Journal	Mining Industry magazine	www.mining-journal.com
Nickel development institute	Nickel industry statistics	www.nidi.org
Silver Institute	Silver	www.silverinstitute.org
Steel Dynamics	Steel	www.steeldynamics.com
Steel Service Centre Institute (SSCI)	US steel data	www.ssci.org
The Aluminium Association	Aluminium industry statistics	www.aluminium.org
ULSAB	Ultra-light steel auto body	www.ulsab.org
US Defence National Stockpile	Strategic commodity stockpile	www.dnsc.dla.mil
World Bureau of Metal Statistics	Industry statistics	www.world-bureau.com
World Gold Council	Gold marketing statistics	www.gold.org

Source: Company data, RBS

Notes

http://strategy.rbsm.com/disclosures - View this page for additional Important Disclosure Information for Research Recommendations including Recommendation history.

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